THE

SOUTHERN AGRICULTURIST.

JUNE, 1834.

PART I.

ORIGINAL COMMUNICATIONS.

ART. XXXIII.—*Preparation of Beet Sugar; by* Dr. F. WURDEMANN.

Being an extract of a letter from Dr. Wurdeman of this city, now in Paris, to Dr. Ravenel, and communicated by him, for publication in the Southern Agriculturist.

"Paris, December, 1833.

THE beets are collected when ripe, or little before that time, and immediately brought to the cleaning machine. This consists of a cylinder composed of rils of wood, and revolving in a trough filled with water; into this cylinder the beets with their tops, as torn from the ground are put, and thoroughly washed; one objection to cutting off the tops before washing, is that a quantity of saccharine matter escapes. They are then brought to the rasping machine, which breaks down their cellules and reduces them to fine pulp. In some places the beets are brought dried to the manufactory. They should then be cut in transverse slices, and dried in a stove heated somewhat below the temperature of boiling water, that being sufficient to destroy the principles of organic life in the beet, and which militates against the action of affinity present in all inorganic substances. The temperature should be below 112° Farh. as it appears that at that point the colouring matter

is formed readily, either from a reaction taking place between the principles contained in the beet, or during the maceration, from the water used in that process. For the same reasons the time and degree of heat used in maceration, should not exceed that requisite to extract the saccharine matter.

The quantity of fibrous matter contained in the beet is so small, in proportion to the liquid, and the cellules containing the latter, are so minute, that it requires a most complete rasping to prepare them for the press. The presses most esteemed are those which press but a small quantity at a time, and that with expedition; as by these means most juice is obtained from the pulp. They are of two kinds, the screw and the hydraulic; but the limits of this paper will not permit me to give you a description of either; suffice it to say, that the pulp, having been placed in strong closely woven cloth, is submitted to these presses, and the juice flows immediately into cauldrons, (coppers) in which it undergoes the process of defecation. From good beets Dombasle obtains 85 per cent. of juice; from good and indifferent 60 per cent. is usually got. From boiling them and then cutting them in slices, over whicha current of water flows successively, he has obtained 90 per cent.; 60lbs. of juice of good white beets yield from 4½lbs. to 5lbs. of raw sugar; those grown in rich wet soils give less.

The juice thus, or otherwise obtained, is subject to a spontaneous alteration, which is important to know. If exposed to the atmosphere, it gradually acquires a stringy and oil-like consistence, which, increasing in proportion to the evaporation of the liquid, at last resembles that of the white of an egg. These changes take place in less than twenty-four hours, when the temperature is at 20° to 24° *centigrades.* The mass which before this change never showed any free acid, now contains both *acetic* and *nancéique* acids, (the latter described by Braconnot in 1813—*Annales de Chimie.*) It is supposed that this alteration takes place in the beet itself when kept in too large heaps, and thus subjected to too high a temperature. It is the formation of this viscous matter which presents a great obstacle to the crystallization of the sugar, and which glueing together the crystals prevents the molasses escaping. To guard against this alteration of the juice, the

utensils used in keeping and in stirring the beet juice should be kept scrupulously clean, and the greatest celerity possible should be used in all the necessary operations, from the grinding to the defecation. The instruments of wood must be frequently washed with the greatest care, and when laid aside, should be covered with milk of lime, and which should not be removed before their immediate use is required. One of the best means to prevent this alteration in the beet juice, is to employ small coppers, capable of containing about two hectolitres (two hundred English quarts) each; five of this size are capable to serve for the fabrication of 30,000lbs. of beet juice per diem. Although the heat may be applied to a large copper, long before it is filled from the juice flowing from the presses, two much time passes before it is full, and arises at the temperature of 70° or 80° centigrades, at which temperature the juice may be considered safe from the alteration above mentioned.

I will not dwell on the *modus operandi* of the substances used in the defecation of the juice, but proceed, at once, to state the process most generally adopted. The quantity of lime varies from 2½ to 3½ "*grammes*" for each "*litre*" (quart) of the juice. As a general rule, the quantity must be increased in proportion to the quantity of saccharine matter contained in the juice. The purest lime should be used, and in its greatest degree of causticity, and it should be reduced into a clear pap by means of a little water before put into the coppers. It is best to put it in the copper as soon as a few bucketfuls of juice has flowed in, it acting in preventing the decomposition already so much insisted on, which is apt to take place to a more or less great degree before the juice arrives at the requisite degree of temperature.

Two methods are now used to complete the operation. One consists in preventing the boiling of the juice, by extinguishing the fire before it arrives at 100° temperature, and then being left at rest for half an hour, when the scum rises to the surface, the liquid is afterwards drawn off by a cock placed near the bottom of the copper.

The method preferred by Dombasle, is to continue the fire under the copper, and, when near the boiling point, watch the *first bubble* which swells under the scum; immediately take a ladleful of the juice from the spot where

it arises, and pour on the spot a quart of cold juice which checks the action immediately; the same operations must be repeated as often as a bubble appears, (which must never be permitted to burst and spread over the scum) until, by examining the liquor taken up in the ladle, the defecation is found complete, when the fire must be extinguished, and the liquor allowed to rest for a half hour before drawn off; always guarding the bubbles, which may continue to rise, from bursting by the means already indicated. By this method, the operator is rendered complete master of the work, and in those cases, in which sufficient lime has not been used, he can have time to add more when he finds that complete defecation will not take place. For this purpose he has only to dilute a quantity of the milk of lime in the cold juice, which he pours into the copper. Even the introduction of the cold liquid alone sometimes produces a remarkable effect; a single quart changing the state of the liquor and causing the separation of the feces in large flakes. The complete defecation is known by the liquid in the ladle being of a fine white wine colour, and perfectly transparent, and that the feces are divided into large flakes which settle quickly to the bottom of the ladle. The liquor having been drawn off, the scum and residue are then placed on cloths extended over a table composed of wooden ribs, and having an elevated border; below this is placed an inclined plane which conveys the juice into a reservoir containing the rest of the clarified juice. The cloths should be of cotton in preference to wool, which the lime, still retained by the feces, is apt to rot.

Now, place the juice thus defecated into coppers destined to concentrate it. The form of the different coppers is not an unimportant object. Those used in defecation should be deep, viz. the depth half their diameter; and when bullock's blood is employed in defecation, they should be as deep as wide. The coppers for concentration should be as wide as one foot in depth to four or five feet in diameter, those for cooking differ from these last only in having their bottoms three "*lignes*" in thickness at least. The combustible matter is pit-coal or wood, and the furnaces must be adapted to each. Animal charcoal is used in the concentration; that made from bones and not horns is employed. Its action is not confined to removing the

colour, but it acts also in an inexplicable manner, enabling the syrup to support a higher degree of temperature; and without it, it is almost impossible to cook the syrup on an open fire, which process will now be described.

Place the clarified juice into the concentrating coppers, and saturate the excess of lime, if it exist, by diluted sulphuric acid; it should not be rendered completely neuter, only so far that the purple (tournesol) paper changes slowly blue. Then pour in the animal charcoal in the proportion of 1½lbs. to a "*quintal*" (100lbs. weight) of the liquor. Boil and continue the concentration until the hot liquor supports *(porte)* 20° *à l'aréomètre de Baumé.* It is then withdrawn and left to deposit in deep wooden vessels and kept in a cool place, where it precipitates during cooling, a great quantity of calcareous salts, among which the malates are most abundant. When the syrup is perfectly clear, (at the end of twenty-four hours usually) it may be submitted to the action of cooking *(cuite.)*

Being placed in the cooking coppers, carry it, by a brisk fire to 32° of *aréomètre* of *Baumé.* Extinguish the fire, and throw in animal charcoal, in the proportion of ¾lbs. to a quintal of the juice which has furnished the syrup, viz. half the quantity employed the first time. Let the syrup now cool to about 75°, stirring it occasionally to mix the charcoal well with it; then carry it into the clarifying coppers, and submit it to the usual clarification of bullock's blood; it is then drawn off clear and the cooking proceeded with. The scum, &c. is placed on woollen cloths to drip. The preceeding is considered the most difficult part of the process. The cooking coppers now receive it, and the point of concentration is told by touching the ladle dipt in the syrup and drawing out the thread. The thumb being below, when the finger is drawn from it, the thread should break at the thumb. The thermometers used for this purpose are rejected by M. Dombasle, as not to be relied on. When of the proper consistency, it is poured out into the "*rafraichissoir,*" where it crystallizes.

The method recommended by Payer, is to evaporate the *defecated* juice to twelve degrees of Beaumé, without adding any animal charcoal; then draw off all the liquid into a filter filled with animal charcoal; evaporate *rapidly* the filtered liquid to twenty-five degrees of Beaumé, and filter again through a filter of Dumont with fresh animal char-

coal. The syrup is thus rendered ready for the cooking, it yields more crystals of a more beautiful hue, and the suppression of the bullock's blood no longer leaves a portion soluable and alterable. Payer recommends also the copper on a pivot for *cooking* the clarified juice, it (cooking) being in this accomplished in five or eight minutes, while the other method requires thirty or thirty-eight minutes, moreover, the alteration is six times less in syrup cooked in this than in the usual stationary coppers. The fire being brisk the ebullition is commenced in one minute in every part of the copper; frequently the syrup is too viscous and rises in a thick froth, and incompletely wetting the bottom of the boiler, hazards the burning of the sugar; to check this instantaneously, throw in a small quantity of fresh butter, four or five *grammes*, which Dombasle recommends to have been previously melted, as that operation prevents the sugar receiving any flavour from it; as soon as the syrup, by means of the touch, is found cooked, draw the cord, and thus canting the copper, its contents pour out at once; open the stop cock and proceed with the process; seven or eight products being thus united in the rafraichissoir, it is rolled into the rooms containing the forms, for much of the French beet sugar (raw) is in loaf form.

I have thus, my dear Sir, given all the information I possess relative to the manufacture of beet sugar from the expression of the juice to the crystallization. I have drawn freely from the latest and most esteemed works, but as yet have not been in a refinery. I thank you for the hint, how I may render my stay here serviceable to my native city; and shall use my endeavours to gain admittance into a refinery before my return.

I am, with great regard, dear Sir, yours, very respectfully.

F. WURDEMANN.

Art. XXXIV.—*Observations on the present condition of the Southern States; by* Agricola.

The present crisis in our national affairs is certainly one, which the Southern Planter must regard with the most painful anxiety. It is one pregnant with consequences of the greatest importance to the nation at large. A dark and threatening cloud hangs over our land, and whether we shall be visited with the whirlwind and the tempest, or whether it shall pass by, and the sunshine of peace and contentment again illumine our prospects, yet remains in the womb of futurity; but it behoves us to be prepared for either event. If it be ordained that the tornado shall sweep over our land, and our fair prospects of wealth and of greatness shall be blasted, we shall not be the worse off, for having contemplated the probability of such an event, and for having endeavoured to avert its fury. Should our fears, however, prove groundless, and the rumbling of the distant thunder cease to agitate our minds, yet shall we be benefited by having been prepared for it. It is not our intention to enter into any discussion on the great question which now agitates and distracts our councils. Our present object is merely to throw out a few hints, which may perchance be of use to some of our planters.

It is a well-known fact, than the quantity of cotton already grown is fully equal to the consumption, and by many, it is believed, to exceed it. It is also well-known to our planters, that at the present prices, it is far from being a crop, which makes a good return for the capital vested in it. It is, we believe, a losing business to many—we say a losing business, for we consider all such, which does not yield us that interest on our capital, which we could obtain for it in other pursuits. If such be the case, and we think there are few who will deny it, it will require but a small share of discernment to ascertain, that it has become necessary for us to retrench our expenses as far as possible, that we should live as much within our income as it is practicable; and that we should commence a system of frugality and economy, not only on our plantations, but even in our very families; nay, more, it may be necessary in many instances to push this even to extremes. We are

aware how much easier it is to lay down rules for our conduct than to practice them; we are aware that it is not an easy task for us after having been accustomed to a certain style of living, to descend to that which we consider inferior, that it is not an easy matter for us to relinquish those luxuries, which, from long indulgence, we have been brought to consider as the very necessaries of life.

There is a species of pride which prompts us to imitate the luxuries of the wealthy, and to imitate, if not exceed, the style of our neighbours, and this, too, when we very often know that the consequences will be pernicious, if not ruinous; and it very often occurs that the deeper we are involved, the more anxious do we become to conceal it from the world, and the more strenuous to maintain the same showy appearance. We cannot brook the idea that our more wealthy neighbour (who by the by, may be in equally as bad circumstances as ourselves) should look down on us with pity, if not with contempt. We cannot bear the thought that the world should know that we are not as wealthy, as it was willing to believe us to be, and thus lose the importance attached to our riches. But surely this is a false pride. Neither the dignity nor the usefulness of a man consists in the extent of his possessions, and it is surely more praiseworthy for him, to exert a small portion of his firmness, and at once check his mad career, than to continue the deception until it is beyond his power to control his destiny any longer; and certainly we should think it wiser in him to retrench whilst he has it in his power, than to continue his course and reduce himself and his family to the brink of ruin, perhaps, to want, for such must be the final termination unless unforseen circumstances prevent. Many put off the evil day, and because they have a sufficiency to support themselves thus, as long as in all probability they shall live, think not of the future, and finally leave their families in the most abject distress. This is selfish and unmanly, and cannot but be condemned by all, however much we may be inclined to follow in the same track. We have said that we should economize in our families, and live for the present, at least, by the strictest rules of frugality. But having gone thus far, we presume to go no farther, we enter not into the privacy of domestic life, we pretend not

to dictate in this matter. What is economy in one, may be prodigality in another. All that we can recommend is, that each should endeavour to his uttermost, so far to retrench his expenses, that his income shall not only be equal to, but even exceed it, so that there may be an excess which may be appropriated either to the extinguishment of old debts, or the purchase of other property.

It is our wish to enter somewhat more fully into the details of the economy of our plantations, and to touch on some few of those sources of expenditure which have for many years past drained us of such large portions of our income. We believe that many of our planters on this score have been both negligent, and wasteful. We believe that much has been expended which might have been saved. We believe that expenses have been incurred which need not have been, had we but justly understood and estimated our own resources. This has not been the case, and we are now reaping our rewards. The evil is not, however, past bearing, nor beyond a remedy. It but requires that we should turn our attention seriously to the subject, and manfully to persist in the execution of our design of reformation. The first step towards this is for us to determine to live as much as possible within our own resources, to purchase nothing for our farms or plantations which we can rear or manufacture at home, thus leaving whatever may arise from the sale of our crops almost untouched. We do not pretend to say that all that is needed on a plantation can be there obtained—we know that this is not the case—we know that in many instances it will be better to purchase, rather than attempt the making at home. But we do say that more than two-thirds of our expenses on our plantations may be saved by a just distribution of the labour of our workmen. And here permit us to introduce two trite sayings, and which it would be for the benefit of our planters to reflect on, somewhat oftener than they do. The first is, "a penny saved is a penny gained," and the other is "take care of the pence and the pounds will take care of themselves."

The first item which we would recommend to the consideration of our planters is, that they should raise on their plantations, at least, as much grain as may be equal to the consumption of the place; let there be rather an excess than a deficiency. During the prevalence of the cotton

mania, (for we can call it by no softer name) this was almost altogether neglected, and we depended in a great degree on importations for our supply of provisions.—Our whole thoughts were given to cotton. This was the theme of every conversation, and every thing else appertaining to agriculture was deemed of too little consequence, to divert in any manner any part of our attention or labour. We became completely infatuated, neglected every thing else and became purchasers of what with the greatest ease might have been produced on our plantations in abundance. During the period when cotton bore such extravagant prices, some plausible reasons might have been assigned, for thus deviating from what appears to us to be the true policy of every planter, but that this state of things should continue after the cause which produced it has ceased, is surely a matter of some surprise. But so it is, although we cannot make use of the same plea in extenuation of our fault. During the period to which we refer, it was said, "that an acre of cotton would purchase the produce of several acres of corn, and therefore it was better to plant all cotton, and purchase whatever corn was necessary for the consumption of the plantation." In some instances this might have been so, but we doubt whether at any time this has been a correct system of management, and we are inclined to think that the whole has been supported by arguments drawn from false datas. The principal of which have been,

1st. In overrating the quantity of cotton produced, and the price likely to be obtained, and underrating the corn both as to quantity, and the price we would have to give for it.

2dly. In not considering the difference of work required in working and preparing the product of an acre of cotton for market, and the labour bestowed on an acre of corn, and how much more a labourer could attend of the one than of the other.

3dly. In not apportioning justly the work necessary to be done, to the means we had for accomplishing it, and on this, perhaps, more depends than at first view of the subject appears. Thus it sometimes happens that less is accomplished than might have been, and it is owing to this that we see one planter with the same force performing nearly twice as much as any other.

But it is not our intention to enlarge on these topics. The present low prices of cotton will force us, if it has not already done so, to abandon a system of management, which has for its object the raising of one article alone, with the product of which we are to purchase all other things necessary for us. This is regarded by many as a great calamity, but we confess that we do not view it in this light; it is true, one of the staple articles of our State has been reduced in value; yet, still, we do not see cause for despondency. The resources of the Southern States have never yet been fully developed, and we believe that there are many sources of wealth, which are either untried, or but just coming into notice, which may once more restore to us those days of prosperity which now appear to have glided from us for ever. On this subject we intend not now to make any observations, we will confine our remarks to the policy proper to be pursued by our planters as individuals and not as members of a body politic. We intend also to be brief in what we shall say, wishing rather to draw the attention of our planters to the subject, and then leave it to their better judgment, than to enter into any crude details of our own.

We have said, that each planter should depend on his own resources, and rely more on the means which have been placed within his reach, for the supply of such things as may be needed on his place. In this respect, at least, we would wish him to imitate our northern farmers, who usually so manage their affairs as to leave the proceeds of their principal crops untouched for any of the expenses of the farm: and thus would we wish it to be among us here. Let our planters raise their own provisions, their own horses, or mules, their own oxen and their cows, their sheep and their hogs.

An intelligent stranger would, perhaps, be surprised at this list of (we would almost say) indispensables, to every farmer, things without which no farm can be well conducted. Yet, alas, how few are there who do not depend altogether on purchasing every article here enumerated, if we except that of cattle. Yet each and all, can be raised on almost every farm, sufficient for the demand, without materially diverting any of the labour, which might be wanted for other purposes, and is it not a shame to us

that these things should be bought instead of being raised at home. And is it not a greater shame to us, that instead of being able to supply one another with the articles wanted, that we are obliged to seek for them abroad—to import corn from the North, and hogs, mules and horses from the West. Thus it is that we have ever been drained. We have been accounted rich, and we have even believed it, but we have been only nominally so. We have received large amounts for our cottons, but it has passed from us for these necessary supplies, and if a true balance sheet was exhibited, on which should be set down all monies received for cotton, and all expended by us for articles, which were absolutely necessary, the balance in our favour, would, we fear, be but very trifling, compared to what is generally supposed. Thus giving to us the appearance of wealth without the reality, and by this very deception, have we been brought almost to the verge of ruin, by causing a greater carelessness in the management of our affairs, and introducing a more luxurious style of living among us.

We have digressed from our subject and will now return. We confess that we wish to see even more than this accomplished. We wish to see our planters not only raising their own provisions, horses, mules, cattle, &c., but even manufacturing the clothing necessary for their workmen, the bagging necessary for their cotton, and the rope necessary for baling it. We may, perhaps, be deemed visionary for even touching on these subjects, yet we do not hesitate a moment to say, that all can be done, and so done, that we shall gain considerably by it. Moreover, we have not the slightest doubt but that the day is not far distant when it will be done. And can this be done? We say that it can, we are so situated, that there is not an article grown or manufactured, which may be necessary for us to have, excepting, perhaps, a few articles of luxury, but which may be brought to perfection among us. We have all the materials for being a great and independent State, and we lack but the spirit. It is in the power of our planters, to be the most independent agriculturists in the world. We admit that these are broad assertions, but we think that they can be supported both by arguments and facts.

Now what are needed by a planter for his plantation? Provisions and clothes for his negroes; horses or mules for

his work; sheep, hogs and cattle, for the general good of the place. That all of these can be produced on his place, we presume no one will pretend to deny, the point to be considered is not the feasibility of the thing, but the expediency of it, not whether we can execute, but whether we shall gain or lose by it; finally, whether it be more economical in us to raise and manufacture these articles for ourselves, and among ourselves, or purchase them. We think it is for our interest to do this among ourselves—we think it will be for the good of the Southern States generally if the planters will pursue this plan. We may, perhaps, take up this subject at some future period.

AGRICOLA.

ART. XXXV.—*Account of an Embankment of a part of the Santee Swamp; by* Major SAMUEL PORCHER.

[When, in 1832, we made an excursion into St. John's Parish, we visited among other places, the plantation of Major Porcher. In riding over it, we were particularly struck with the extensiveness and magnitude of a bank, which he had made to protect his swamp lands bordering on the Santee river, from freshets. It was our intention to have taken particular notice of this bank in the account of our excursion, but on returning home, we found, that from some cause or other, we had neglected to note some particulars which we deemed important, and being unwilling to trust to memory, we wrote and requested Dr. Ravenel to obtain the information for us. He applied to Major Porcher, who soon after forwarded to us the following letter. It, however, unfortunately arrived too late for us to make use of. Expecting then to revisit that neighbourhood before long, we did not publish this letter, intending to have given a very full and minute account of this excellent piece of work. Circumstances will prevent us, in all probability, from doing so, for some length of time. We wish, however, to inform others, how much can be accomplished, by a judicious arrangement of labour, without lessening the crops cultivated, or otherwise deranging the ordinary operations of the plantation, and therefore, now give the account furnished us by Major Porcher, with a hope that it will induce others to go and do likewise. One remark only will we make, and that is, that those unaccustomed to such works will have but little idea of the magnitude of the work accomplished, and the beautiful and substantial manner in which it is executed, from the account now given. To be justly appreciated, it ought to be seen.]—*Ed. So. Agr.*

"Mexico, November 23, 1832.

Dear Sir,—Dr. Ravenel informs me you wish some information relative to my embankment, which I comply with

pleasure. I commenced the work in 1817. It being generally believed to be a fruitless attempt; I resolved not to be much of a loser by the experiment, therefore only bestowed labour when it could be conveniently spared, viz. between hoeing and harvest, and between planting and hoeing, (never planting a smaller crop than usual,) the expense, therefore, was only that of the spades and wheelbarrows. I moreover have settled almost entirely two plantations in that time, without purchasing any of the materials—add to that, I have been unfortunate in there having been several extraordinary high freshets during the time I have been at work on it, and received great injury three times, adding as much labour as I could bestow in as many years. The land is well calculated for a work of the kind, and commences at the high land. I fortunately passed but one place where the natural surface was injured when the bank broke, in that place there was somewhat of a quick sand, and it was the only one which broke where the water did not get over the bank—the breach was 60 yards in length, and 24 feet deep. Not despairing, I made a bank 260 yards in length, and where it crossed the same creek, I dug a large ditch, (I suppose about 60 feet in length) and filled it with clay 8 feet deep, before I would venture to make the bank; it has withstood three much higher freshets than that which broke it.

The bank is four miles and a quarter in length, from 9 to 13 feet high, the width from 30 to 50 feet at the base. I finished the bank in September last, and expect to continue to improve it as long as I live. I have persevered notwithstanding the difficulties and discouragements I have had. As was natural, experience was wanting in some measure which could not be foreseen. For instance, although the level was correct, the water from the course of the river would rise higher in some parts than in others, hence some of the breaks. To meet the difficulty, I took the level of the water during the height of a high freshet, and made the bank to correspond at such places. I consider that I have succeeded, as I do not think my losses have amounted to more than one entire crop, that I usually plant on that land. The quantity of land enclosed is about 1300 acres. I have been thus minute after stating the great length of time I have been engaged, as it would be discouraging to others to attempt it.

I will add one more circumstance; I never, in any one day, had more than thirty hands employed on it.

I remain, with great respect, dear Sir, yours, &c.

SAMUEL PORCHER.

ART. XXXVI.—*On the Management of Horses whilst travelling: by* B.

[The following most excellent directions for the Management of Horses whilst travelling, were written for us by a friend, at our request. Being unwilling that we should alone be benefited, we have inserted them in the Agriculturist, not doubting but that they will prove as acceptable to a majority of our readers, as they have been to us.]—*Ed. So. Agr.*

"April 24, 1834.

Dear Sir,—As it is your request, I will now endeavour to say something about the treatment of a horse upon a journey, though, I assure you, that you have travelled much more than I have. I will, however, say, how I would treat my nags.

It is of great importance that the horse be in good condition before the journey is commenced—not very fat: he should eat nothing but the most solid food for sometime before you start, nothing light or green; for nine out of ten horses will founder if fed on green food. *Early* in the morning give a few swallows of water; for some horses will not eat without, particularly if feverish at night. Give three quarts of corn soon after the water; he should not be limited in fodder, but let him have it before him from the time he is put up at night till you start. Give him as much water as he will drink before you start, travel very slow for the first hour, for many horses are foundered from the body becoming suddenly hot when full of cold water, just as when the reverse happens, filling the body with cold water when it is hot. Give about a gallon of water frequently, for by giving a small quantity often, the stomach is kept more cool, and there is less danger. Twice or three times during the day, put about a pint of corn-meal and a little salt into the water, and stir it well in. *Whenever* you water on the road, move off the horse *immediately*, to stand still after drinking is very wrong. When you stop for any time, say an hour or so, do not water till you are going off. I never give corn during the

day—three or four quarts of oats may be given, and fodder or hay, for the quantity he will eat will not injure him. In hot dusty weather it is very gratifying to the horse to wash or wipe the face, and the inside of the nostrils with a sponge and cold water, and if you add a little vinegar, it is better;—do this at the time of and before watering. When you stop for the night, let the horse go into a lot to wallow and walk about for half an hour, then let a few bundles of fodder or hay be given to him while he is rubbed, curried, and brushed, and afterwards as plentifully as can be given. When cool have his legs washed with soap and cold water, and the feet picked out, and then let him have his fill of water, but without salt. Be careful that the horse *always* eats some fodder *before* he gets his corn: give a strong large horse eight quarts of corn at night, or as many ears as are equal to it—it is better to feed on the ear than to shell it, as the horse eats not so fast and will perhaps eat less. If the corn is new, give but half the quantity; always give oats in the morning if to be got, six quarts will not injure a horse. If the horse gets galled, wash the parts with *strong* whiskey and water. If your horse becomes dull and heavy on the journey, or loses his appetite, tie a lump of gum assafœtida on his bit, covered or wrapped in a strong rag. This may be continued for the whole journey, and I believe prevents his taking any distemper if put with sick horses, or in stables where they have been; it also is a preventive of founder. Horses sometimes get lame on the road without any apparent cause. It is generally from being improperly shod. There are such various notions as to the treatment of a horse when foundered, that it is difficult to know what to say on the subject. I would bleed freely from the neck—give a pint of whiskey with a little warm water and molasses, with a lump of alum about the size of a nutmeg dissolved in it, and urge the horse on his journey.

I have now, my good Sir, said what I would do with my horse on the road, and if any part of it is worth your consideration, you are welcome to it. Hoping that you will excuse great hurry and blunders, and with my best wishes for your having a safe and pleasant time of it.

I remain, yours, with regard. B.

ART. XXXVII.—*A Memorandum of Tasks, which every able labourer is capable of performing daily, at the different employments of the plantation, from reclaiming the land to shipping the produce for market; by* D.

In ditching, 700 square feet.
Putting mud upon the bank, 700 " "
In forming new drains 15 inches wide, 2½ feet deep—210 feet in length.
" clearing old drains, 6 to 10 quarters, according to the mud.
" " " ditches 1 to 2 " " "
" placing this mud on the bank, the task will be the same.
In digging up land, 1 quarter.
" chopping " ½ an acre.
" getting task stakes 500.
In laying out fields into quarters, say 105 feet, a man and boy will do 40 acres.
Trenching, 3 quarters.
Covering, 3 "
Sowing, 9 "
Threshing, 500 sheaves for a woman, 600 for a man.
The 1st and 2d hoeing, chop short and deep, ½ an acre.
The 3d hoeing, from 3 to 4 quarters.
In getting staves, 4 men to 800.
" drawing " 500 to a man.
" getting shingles, 3 men to 1000.
" drawing, 1 man to 500.
" in getting heading, 4 men to 300.
" cutting hoop-poles, 1 man to 100.
Squaring timber, " 100 feet.
Sawing pine, 100 feet; cypress, 120 feet.
Splitting rails, 100.
Fencing, when the rails are on the spot, and the worm is laid, 100 pannels—9 rails high and rider.
Cutting wood, 1 cord, say 8 feet long, 4 high, 4 wide.
Splitting garden pailings, 500 to 3 men.
Posts, 1 man to 20.
Plaining boards, 600 feet; jointing, 600 feet; beading, 600 feet; laying bricks in a solid wall, 1000; turning arches, 500.

Coopering rice, a man and boy, 20 barrels.
Shingling, a square of 10 feet.
Getting cypress stocks of timber out of the swamp, one stock to each hand.
Bedding for corn, ½ acre.
Listing " " 1 acre.
Bedding potatoes, 2 hands bed and plant one quarter.
The same in digging for harvest.
Hoeing and hauling up ½ acre.
Hoeing corn, 1 "
Stripping blades, 1 "
Breaking corn, 1 "
Planting slip vines, 2 to list, bed and plant 1 quarter.
Levelling and digging land which has been bedded, one quarter and a half quarter.
Making whole rice barrels, 3 per day.
" half " " 4 " repeated.

The foregoing tasks may, under some circumstances, be too large, and should be varied according to the state of the land, &c. particularly in ditching and hoeing, for in many places it would be easier to ditch 800 feet than it would 500 feet, where there are stumps, springs, sand, &c.

Commence planting about the 15th of March, flow immediately and clear off the trash, the water to be kept on from 3 to 5 days, (say 3 days.) When the weather is warm, leak off the first day with a stick in the trunk, dry the field on the second. As I do not approve of the point-flow, I will only recommend it where the land is stiff, and many small clods upon the rice, then run on two tides and off again. Hoe the first planted rice the 10th of May, and put on the long-flow by the 15th, which may remain on for 15 or 20 days, according to the appearance of the rice, or as long as it continues to grow through the water. The first three days, this flow should be deep, and all trash should be carefully removed, then leak off, until the blades of the rice appear upon the surface of the water. Put a notch in the stems of the trunk, and keep the water as near as possible to this depth, after the fields have become quite dry, which will be the case in about a week after the water has been turned off give the second hoeing, which should be like the first. Chop short and deep, and take care to pull the grass

from among the rice, and if convenient, hoe a third time. Let your rice now be kept dry for at least three weeks, or until the rice begins to grow again, then put on the joint-flow for about 8 or 10 days, the same depth as before. If at this time the rice is very clean and forward, say one inch between the first and second joints, the water need not be drawn off again, but merely changed occasionally until harvest; should it be necessary to take off the water, be very careful, as at this stage the rice is tender, and should not be kept dry longer than is sufficient to clean the field. The worm sometime attacks the roots when flooded, and may be known by the blades changing colour and becoming quite pointed and wilted; draw off the water for about a week, or at least 6 days.

The third hoeing should be shallow, and all grass carefully picked from among the rice. One circumstance should be particularly observed, when the rice is in blossom to allow no hoeing, picking, or pulling the grass, no matter how much it may be required, wait until the rice is turning yellow or getting hard.

D.

Art. XXXVIII.—*On the Bee-Moth; by* Tyro.

"Richmond County, (Geo.) February, 1834.

Mr. Editor,—As I am not learned in the science of entomology, I shall be able to give but a rude description of the bee-moth, or miller. Whether the larva of this insect is produced in any other place than the bee-hive, I am unable to say—nor does it matter much, as it is in those sweet store-houses only, that these *vandals* do us such harm. In May, the fly deposits its egg near the edge of the hive, and as soon as they are hatched, the larvæ that is produced take possession of the secret places and

advance by degrees upon the hive, producing and reproducing their species, till the whole inside of the hive is solidly lined with them, and in one year (or season) a flourishing republic (I believe bees are republican in their government, and only require a certain number to constitute a nation, and not a king) is driven to destruction.

As soon as it is discovered that the larvæ have a lodgement in the hive, which is known by small black specks deposited on the bench, and sometimes small particles of yellow wax, the bees should immediately be driven from the hive or killed, and the honey taken to *save the enemy the trouble* of doing it. The egg I have never seen, but the larva I have, from the period that it was scarcely discoverable to the naked eye, to its chrysalis state, safely secured in a strong cocoon to the inside of the hive. From this chrysalis is soon produced a fly of a whitish colour, half an inch in length, something like the butterfly of the silkworm. I have seen the maggot or larva three quarters of an inch long, nearly as large as a crow's quill, and so fat and active that a half dozen bees could not catch and hold him long enough to sting him. The shape is the same as the maggot of the green fly, they are of a darker colour, and have a brown head, which is quite small.

I never keep a hive longer than a year. After the bees have done swarming, say the latter end of May, I drive the bees out into a new hive, by taking off the top at night and placing upon the old hive a new one, then with a little cotton or cotton rags blow smoke in the bottom of the hive, at the same time gently striking the sides, which will cause the bees soon to leave the old for the new hive. In the fall, I kill with sulphur all the bees I do not want for stock, which is, about six hives, and enough for any one.

TYRO.

J. & R.

ART. XXXIX.—*An Authentic Account for the Cure of the Bite of a Rattle Snake; by* ANTIQUARIAN.

Mr. Editor,—Since reading the letter of Dr. Mease, published in your last number, page 237, I have been looking over some old newspapers, and have discovered an authentic account of the method pursued by the negro Cæsar, in *curing poison and the bite of a rattle-snake*, which I send you for publication, as it treats more fully of the whole mode of cure. It appears to be published by authority, as far back as the year 1750.

Your's, &c. ANTIQUARIAN.

[From the Carolina Gazettte, May 9, 1750.]

"*Mr. Timothy*,—I am commanded by the Commons House of Assembly, to send you the enclosed, which you are to print in your gazette as soon as possible. It is the negro *Cæsar's* cures for poison, and the bite of a rattle-snake. For discovering of which the General Assembly hath thought fit to purchase his freedom, and grant him an allowance of £100 *per annum* during life.

I am, &c. JAMES IRVING.

The negro Cæsar's cure for poison.—Take roots of plantane and wild horehound, fresh or dried, three ounces; boil them together in two quarts of water, to one quart, strain it. Of this decoction let the patient take one-third part three mornings fasting successively; from which if he finds any relief, it must be continued, till he is perfectly recovered: on the contrary, if he finds no alteration after the third dose, it is a sign that the patient has either not been poisoned at all, or that it has been with such poison as *Cæsar's* antidote will not remedy; so may leave off the decoction.

During the cure, the patient must live on a spare diet, and abstain from eating mutton, pork, butter, or any other fat or oily food.

N. B.—The plantaine or horehound will either of them cure alone, but they are more efficacious together.

In summer you may take one handful of the roots and branches of each, in place of three ounces of the roots of each.

For drink during the cure.—Take of the roots of golden-rod six ounces, or in summer two large handfuls of the roots and branches together, and boil them in two quarts of water to one quart, (to which also may be added, a little horehound and sassafrass.) To this decoction, after it is strained, add a glass of rum or brandy, and sweeten it with sugar, for ordinary drink.

When an inward fever attends such as are poisoned.—Take a pint of wood-ashes and three pints of water: stir and mix them well together; let them stand all night; and strain or decant the lye off in the morning: of which ten ounces may be taken six mornings following, warmed or cold according to the weather.

These medicines have no sensible operation, though sometimes they work in the bowels, and give a gentle stool.

The symptoms attending such as are poisoned.—A pain of the breast, difficulty of breathing, a load at the pit of the stomach, an irregular pulse, burning and violent pains of the viscera above and below the navel, very restless at night, sometimes wandering pains over the whole body, a retching and inclination to vomit, profuse sweats, (which prove always serviceable,) slimy stools, both when costive and loose, the face of a pale yellow colour, sometimes a pain and inflamation of the throat, the appetite generally weak, and some cannot eat at all; those who have been long poisoned, are generally very feeble, and weak in their limbs, sometimes spit a great deal, the whole skin peels, and likewise the hair falls off.

Cæsar's cure for the bite of a rattle-snake.—Take, of the roots of plantane or horehound, (in summer roots and branches together,) a sufficient quantity; bruise them in a mortar, and squeeze out the juice; of which give, as soon as possible, one large spoonful; if he is swelled, you must force it down his throat. This generally will cure; but if the patient finds no relief in an hour after, you may give another spoonful; which never fails. If the roots are dried, they must be moistened with a little water. To the wound may be applied a leaf of good tobacco, moistened with rum."

PART II.

SELECTIONS.

ART. XLIII.—*Address of the President, delivered before the New-York State Agricultural Society at the annual meeting, at Albany, February* 12, 1834.

(Continued from page 248.)

Barley and Hops are becoming important staples of our State, particularly of the northern and western portions. Few persons, I presume, have a just conception of the quantity which we annually produce, or the immense loss we sustain for want of better knowledge and more care in cultivating and preparing these crops for market. Our soil and climate are found to be well adapted to their growth, and we have produced as fine samples of both as are grown in any part of the world. Independent of an increasing home consumption, the hop in particular is always in demand for exportation. If in good condition, it is one of the most profitable crops to the grower that can be raised. If in bad condition, it is often a losing concern, not even affording a return for the labour bestowed on its culture.

Deeming the subject one of deep interest to the community, and as coming particularly within the province of this society, I have been at some pains to collect data from the best sources in relation to the barley and hop trade, with the view of submitting an abstract of the facts to your consideration.

Two-thirds of all the barley grown in the United States is believed to be marketed at Albany and the neighbouring towns upon the Hudson. The amount brought to our market last year, is estimated at 450,000 bushels. It is of two kinds—two rowed and six rowed, one possessing a thin and the other a thick skin, and larger berry, ill adapted to be malted together, as one kind malts quicker than the other, and becomes sensibly deteriorated before the saccharine matter of the other kind is fully developed. The two varieties are often mixed by the grower; but that which passes through second hands, as the merchant, boatman, &c. is almost universally so, and is besides frequently adulterated with oats and other foreign matters, which seriously depreciate its value. It is stated that the deterioration and loss consequent upon the bad condition of the barley brought to market the last season,

was equal to ten per cent, or 45,000 bushels—which, expressed in money, at 75 cent the bushel, amounts to $33,750.

Serious as our loss seems to be from the bad management of our barley, it will be found to be no less so upon our hop crop. About 2,300 bales, or 50,000lbs., is the estimated quantity brought to market the last year. Of this quantity, I am assured by the best judges of the article there were not 200 bales which ought to have been denominated *first sorts.* Many of the hops were imperfectly dried, and in consequence of the moisture in them when bagged, a fermentation was induced highly detrimental to their quality. The criterion by which hops are determined to be well dried is, when the stocks become perfectly shrivelled and dry. This is not found to be the case with those sent to this market, and the effect is that deterioration goes on till the hops are used, whereas well dried hops lose very little of their goodness by being kept over. Again—two much heat, particularly in the outset, is prejudicial, as it drives off with the moisture the aroma or essential oil which gives value to the hop. A great portion of our hops are picked too early, before they are sufficiently matured, while other parcels are scorched or otherwise injured in the process of curing; and although they might bear a superficial appearance of being prime, most of them on critical examination were found to be extremely deficient in the principle which gives them value. While the average price may be stated at 18 cents, many of these hops are declared not to have been worth two cents the pound.

Here then—if the data which I have given are correct—are two of the staple productions of our soil, on which we have lost, or what amounts to the same thing, have failed to realize, from 50 to 100,000 dollars in a single year, *from carelessness, or a want of knowledge in their culture and preparation for market.* To what extent might this sum be swelled were we to embrace in this inquiry the other products and labours of husbandry! A like disparity, I apprehend, between good and bad management would be found to exist in almost every department of our agriculture.

Division of labour, although not so well adapted to farm labour as it is to the mechanic and manufacturing arts, is nevertheless susceptible of being advantageously studied and applied by the husbandman. The process of pin making is subdivided into seven branches, to each of which is assigned a distinct set of hands. The advantages which result from this arrangement may be appreciated when I state, that were the workmen who whiten the pins to perform all the different processes, they would cost in making "three times and three-quarters as much as they now do by the application of the division of labour."* This

* Babbage on the Economy of Machinery.

principle is extensively adopted in manufactures, and is no inconsiderable cause of the reduction in price of their fabrics. It has been advantageously introduced into the farming of Great-Britain. Men are kept as much as possible to the same branch of labour, because by becoming familiar with it, they perform more and do it better, as a greater individual responsibility rests upon them. All light work is performed by women and children. A man who can earn six shillings should not be employed upon what a boy can do equally well who is paid two shillings per day. Say a farm affords one hundred days of this kind of labour in a year—the gain to the cultivator by employing the boy instead of the man will amount to fifty dollars.

New articles of culture.—Forty years ago cotton was hardly recognized as an article of culture in the United States. In 1832, it constituted by far our greatest material of export, the quantity exceeding three hundred and twenty-two millions of pounds, and the estimated value falling but a fraction short of thirty-two millions of dollars. In addition to this, the home manufacture of the raw material now gives employment to half a million of our population, while the goods fabricated from it constitute a material source of our internal commerce. Who can pretend to say what will be the greatest staple of our country forty years hence? Almost every discovery in science calls into existence a new art, and almost every new art furnishes a new demand for some product of the soil. It is the province of wisdom to keep pace with the knowledge of the times, that it may profit by its constant improvements. There is already an increasing demand for products of the soil, which we have the ability to supply, but which we continue to import from Europe. Madder, woad, and weld are essential to our manufactures, and the quantity which is consumed draws no inconsiderable amount annually from our country. Our soil and climate are adapted to their culture, and with a little enterprize and experience we may soon be able to supply the home demand. The madder now imported is computed to cost more than two millions of dollars per annum.

The *turnip culture* will yet become, as it has proved in Britain, the basis of a great improvement in our husbandry. Turnips are at the same time an ameliorating and a cleansing crop, and are admirably fitted to precede barley or wheat. But their chief value consists in the abundant product, and the adeption of the crop to the wants of all descriptions of farm stock, at the time when succulent food is most wanted, and when it can be but scantily supplied from other crops. The Swedish variety has a decided preference. On lands adapted to their culture, 600 bushels, or twenty tons of roots from the acre, may be stated as a moderate average crop. The greatest objection to their culture

is the labour and expense of securing them for winter use; but this is far greater in imagination than in reality. On this subject I can speak from personal experience. A neighbour raised last year from five acres of land, three thousand bushels, which he has fed during the winter, and upon which he is now fattening more than one hundred wethers, besides oxen.

The raising of mulberry trees and the production of silk is another branch of rural labour yet new among us, which bids fair to become a source of individual and national wealth, and which this Society can enlighten and promote. The experiments already made have shown, that while the business abstracts very little labour from the ordinary employments of the farm, it is susceptible of yielding a handsome income to the farmer. The early attention of this Society in distributing seeds of the mulberry, has done much towards introducing and extending this branch of labour. It is computed that seeds may have produced half a million of trees, and that this number may have been doubled by individual efforts in that time. A new species of the mulberry, *(morus multicaulis,)* has been introduced from the Phillipine islands through France, by M. Perrottet, which promises new advantages in the production of silk. The tree is as thrifty and as hardy and as easily propagated as the white mulberry, while the leaves being much larger, are far more easily gathered, and are said to be better adapted to the production of fine silk than the other species of this tree. This Asiatic mulberry was introduced into France in 1824, and in 1830, it bore seed abundantly. I would beg leave to suggest that the Corresponding Secretary be instructed to procure seed of the *morus multicaulis*, with a view of its being distributed by this Society.

The demand for silk fabrics is already great in the United States, and is likely to increase in a far greater ratio than our population. The importation of silks in 1832 amounted to ten million dollars. As an article of export, the raw material will be in demand for the European, and the manufactured fabrics for the South American market. France imports raw silk to the value of 30 millions francs, and in Great-Britain the annual importation of the article exceeds 120 millions dollars. Hence, there is little danger of the market becoming overstocked.

The contrast in the profits of good and bad farming is worthy of a moment's notice, and few take the trouble to scan it with care. I have already alluded to the bad management of our hop crop. Had all the hops which were brought to this market the last year been equal in quality to the best, and such they probably might have been with better knowledge and more care in their management—some 20 or 30 thousand dollars might have been put in the pockets of the growers, which they failed to obtain. Let us examine what the difference is in the corn crop. I

estimate the cost of cultivating and harvesting an acre of corn at fifteen dollars, and that a farmer will ordinarily plant four acres. His expense then will be sixty dollars. If the crop yields him thirty bushels an acre—and more falls short than goes over this quantity—and he sells the product at fifty cents per bushel, he will be remunerated for his labour, but get not a cent of profit. *Now, if instead of thirty, the acre was made to produce, by good management, eighty bushels, the four acres, at the assumed price, would pay for the labour and afford him a nett profit besides, of one hundred and thirty dollars.* Here, then, would be a difference, in one year, in the profits of four acres, of $130, all resulting from good and bad management. I beg leave here, as affording to my hands a happy illustration of the contrast I would exhibit, the *practice* of an individual who stands deservedly high as a practical farmer, and as a gentleman of respectability and veracity. I will first show what his land *did* produce; and then what it *does* produce. "The land I now till, (he observes in his letter,) *at first*, would not produce, on an average, more than fifteen or twenty bushels of corn, ten or fifteen bushels of wheat, barley or rye, and from half a ton to one ton of hay." By good management, economizing manures, and a proper rotation of crops, he adds, "some of my fields *now yield* from 80 to 100 bushels of corn, thirty-five to forty bushels of wheat, fifty to 60 of barley, and from two and a half, to three and a half tons of hay per acre, *and with less labour* (except in harvest) *than when I did not raise more than one-third or one-quarter as much per acre as I do now.*" The same intelligence and industry, that have trebled or quadrupled the profits of this farm, will produce like results whenever they are diffused and brought into exercise.

I have thus adverted, gentlemen, to those defects in our husbandry, to which I proposed at this time to call your attention, and have endeavoured to show their magnitude, and the importance of applying efficient remedies. I will now call your attention to some of the available means of placing our agriculture on a more respectable and productive basis. The means which I shall particularly commend to your notice, may be embraced under the following heads:

1. A school, to illustrate the principles of science upon which the labours of agriculture are based, and to teach the best models of practice.
2. A more general diffusion of useful knowledge, in a cheap form, accessible to the humblest conditon in life.
3. Agricultural associations; and,
4. The bestowment of pecuniary rewards, as stimulants to enterprize and industry.

I need not stop to dwell upon the advantages which learning affords to agricultural labour. Science may be defined a study

of the immutable laws of the creator which govern and regulate mind and matter. The study of these laws, and their application to the wants and comforts of life, have for ages constituted one of the highest and most useful employments of man; and have contributed, more than any other human effort, to refine and elevate us above the grosser and degraded condition of savage life. The concentrated benefits of these labours are not proffered to our hands. The pleasures and the benefits which they impart, are held out as noble rewards to mental labour, in the same spirit that the blessings of health and competence are promised to him who "earns his bread by the sweat of his brow." Labour, mental or bodily, is the inseparable attendant of rational enjoyment. And is that knowledge to be contemned, which has done so much good to the world, and which has countless blessings yet in store for the human family? "In a *theological* view," says a late eminent writer,* "science is nothing else than a rational inquiry into the arrangements and operations of the Almighty, in order to trace the perfections therein displayed. And what, continues our author, are the truths which science has discovered? They may be regarded as so many rays of celestial light descending from the Great Source of Intelligence to illuminate the human mind in the knowledge of the Divine character and government, and to stimulate it to still more vigorous exertion in similar investigations, just as the truths of revelation are so many emanations from the "Father of Lights," to enlighten the darkness, and to counteract the disorders of the *moral* world."

Our State may be compared to a general family, the members of which are employed in diversified pursuits, all designed and calculated to promote the common weal—having a common as well as individual object, and all united by reciprocal ties. In this light it is considered as respects crime and want. One is punished, the other relieved, by common consent, and at the common charge. We have erected splendid and extensive establisments for the vicious and the poor. The county of Albany has been at greater expense for its poor than would be required of the State to establish and support a school of agriculture. Would it not evince both prudence and economy to endeavour to *prevent* or *lessen*, these growing evils in society, by devoting a portion of the common means to schools, which should teach the hands useful labour, and imbue the heart with the love of virtue? The adage teaches, "that an ounce of prevention is worth a pound of cure." If ignorance be one of the chief causes of vice, and indolence the parent of want; and if knowledge be one of the main-springs of virtuous conduct, and competence the sure reward of industry—then the more knowledge

* Dick on the Improvement of Society by the diffusion of knowledge.

is diffused, and the more that industry is encouraged, the less we shall be called upon to expend upon poor-houses and penitentiaries. It no longer admits of doubt, that knowledge and industry are the great conservators of public morals, as well as the great instruments of public wealth?

It has been remarked, that the more we provide for any one class, the more it will increase. This would seem to hold good in regard to the vicious propensities of our nature, and why not in regard to habits that are commendable and praiseworthy?

To speak practically. Our agriculture is greatly defective. It is susceptible of much improvement. How shall we effect this improvement? The old are *two old to learn*, or rather, to unlearn what have been the habits of their lives. The young cannot learn as they ought to learn, and as the public interest require, because we have no suitable school for their instruction. We have no place where they can learn the *principles* upon which the *practice* of agriculture is based—none where they can be instructed in all the modern improvements of the art.

* * * * * *

Our periodical publications, devoted to the interests of the agricultural and mechanical classes, have proved highly beneficial, and are daily enlarging the sphere of their influence. These benefits, however, may be greatly multiplied by a cheap work, adapted to the means of persons in humble circumstances, and to the economy of those who are able but unwilling to expend two or three dollars a year for an agricultural paper. It is believed there are more than 200,000 farmers in the State who read little or nothing calculated to improve their knowledge in the business by which they live. With the view of bringing this subject before the Society, I have made inquiries as to the price at which a respectable publication of this character can be printed. The estimates have been predicted upon the supposition, that the editorial labours will be gratuitous—that the subscriptions will uniformly be paid in advance—that arrangements will be made to give it an extensive circulation, and that an addition of at least ten thousand copies will be disposed of. The result of my inquiries is, that a monthly publication, of 16 quarto pages to each number, making 192 pages in a year, can be furnished in parcels of twenty or more, at twenty-five cents per annum. The postage to any place within the State will swell the cost to the subscriber to thirty-seven and a half cents per annum. An amount so trivial, as to win indifference, and to silence the objections of avarice. I submit to you, gentlemen, whether a more efficient mode of furthering one of the objects of our association—the diffusion of useful knowledge—can be devised, than the one here presented. Through the liberality of two public-spirited and highly respected gentlemen, a specimen sheet of the proposed publication has been published, and has been submitted for public

examination. Under the auspices of this Society, the cultivator may be rendered a vehicle of useful knowledge, and a means of effecting great public good. I commend it to your guardian care.

In referring to *agricultural associations*, as a means of improvement, I think I shall be sustained by the opinions of those present, as well as by the authority of past experience, in the little I have to say. These associations tend to promote social and friendly intercourse, and an interchange of kind offices; to make our farmers emulous of excelling in their cattle, in their crops, their buildings and in the neatness and order of their domestic arrangements; they bring them acquainted with each others improvements and means of economizing labour; instruct them in the comparative value of breeds of animals and the relative value of crops. They promote industry, frugality, and the love of knowledge. They tend to multiply our comforts and increase our wealth, by the laudable emulation they call into action, and to enlighten and embellish our country.

And yet I am sensible that these associations find but comparatively few ardent advocates among our farmers. Many are indifferent because they do not appreciate their benefits, or from an apathy, common to our nature, in every measure which does promise present gain. Some will not support them lest they should lose a day or a dollar. And others oppose them from an envious wish to deprive their neighbours of that public commendation which they are conscious they do not themselves deserve, and are not likely to obtain. The man who thinks and acts only for *self*, regardless of the welfare of those around him, and who fancies that he rises because others sink, mistakes alike his interest and his duty, and is a stranger to those ennobling feelings which flow from the disinterested acts of benevolence and philanthropy. If the comparison may be tolerated, I would liken the selfish man to the moon, whose sombre rays impart no vivifying influence upon terrestial objects: and his contra to the sun, shedding abroad on every side his effulgent beams, and dispensing life, light and gladness to all around.

The remaining subject which I proposed to notice, is the awarding premiums for beneficial experiments and improvements in husbandry. I confess I am not satisfied of the utility of paying for the *largest* products or the *fattest* animals, yet I believe there are many other subjects on which premiums may be awarded with public advantage. If my neighbour shall be induced, by the expectation of a premium, to make some new application of science, or some new experiment in practical husbandry, which shall prove successful, and lead to important public benefits, we become gainers, however expensive the investigation on the experiment may have been to him who obtains the premium. In this way great public improvements have accrued; and like

means will produce like results. These rewards are often the exciting cause to active industry, philosophical research, and to the developement of invective genius; which, like the seed, whose latent vitality is quickened into action by solar influence, grows, expands, and matures into fruits of usefulness. Go to the American Institute at New-York, and see the numerous productions which its premiums are eliciting from science and art. Look at Scotland, a country, which is surpassed by none in recent improvements in husbandry, and where agricultural premiums have been awarded for fifty years, and see its society distributing nearly ten thousand dollars a year, as rewards for diligence and skill displayed in her rural affairs. But I need not seek for illustrations abroad. They abound in every county in our State where premiums have been awarded. Upon this subject I quote again my highly respectable correspondent, who remarks in strong language—"I have no doubt that the money which was appropropriated by the State to encourage agriculture, has increased the wealth of this country more than twenty per cent a year."

I have thus gone through with what I propose to embrace in this address. I have pointed out some of the prominent defects in our husbandry, and have suggested means of remedying them at least in part. The means are partially at your command, and over them all you can exercise a salutary influence. I hope the present opportunity will not be suffered to pass without a united and successful effort to advance the objects of public usefulness for which we have associated, and for which we have met on this occasion.

Art. XLIV.—*Culture of Sugar-Cane in Louisiana.*

[From the Manual on the Cultivation of the Sugar-Cane, and the Fabrication and Refinement of Sugar. Prepared under the direction of the Hon. Secretary of the Treasury, in compliance with a Resolution of the House of Representatives of January 25th, 1830,]

(Continued from page 251.)

Process of Sugar Making in Louisiana.—Grinding of the Cane.—The canes, as has been before mentioned, are brought from the field in carts, and delivered under a shed whose roof is a continuation of that of the sugar house, and beneath which from 50 to 100 loads are capable of being protected, at once,

from the weather. The sugar house is a high, two story building, generally of brick from 100 to 160 feet in length, by 50 or 60 in breadth. In a majority of instances it is situated near the banks of the Mississippi, standing endwise to the river, and having one or two projections, one story high and 30 or 40 feet long, situated at right angles to that end of the main edifice which is contiguous to the river. The mill for the grinding of the canes is placed at the remote extremity of the large building; the cane shed, alluded to above, being connected with the same end. That part of the building devoted to the mill and reservoirs for the expressed cane liquor, is separated from the rest of the house by a partition, and occupies a space of about 35 by 50 feet.

The cane-mill consists of three cast iron cylinders, which are arranged either in a vertical or horizontal position. The first arrangement is to be found in the old sugar houses only; the horizontal, being that which is, at present, universally preferred.

The cylinders, in the vertical mill, are from 30 to 40 inches in length, and from 20 to 25 in diameter. They are furnished with cog-wheels fixed on the upper ends of their peripheries, and working into each other, the moving power being applied to the middle cylinder. These cylinders are mounted on an iron frame, consisting of two horizontal pieces, sustained by uprights; the openings of the frame contain brass bearings for the pivots of the three rollers, which brasses are capable of adjustment by means of cross-keys and wedges, driven into openings in the frames, so as to force the rollers towards each other, and retain them at regular and unvarying distances. The surfaces of the rollers are fluited, with grooves of a small depth, which enable them to take a firm hold of the canes, to draw them forward, and also to facilitate the running down of the juice from the canes into a pan or a cup, which is formed round the rollers at the lower part by a plate of iron, turned up all round at the sides and placed in the bottom of the frame.

In horizontal mills the rollers are somewhat longer, being sometimes 5 feet in length, and are arranged in a triangular form one above, and two below. The power is applied to the upper roller, and motion is communicated from it to the others by an arrangement similar to that used with vertical mills. These rollers are also grooved like those which are vertical.

The mill is situated 8 or 10 feet from the ground, or in what may be called the second story of the building, in order to facilitate the passage of the juice to the kettles in the adjoining apartment. The canes are brought up to the mill by means of a machine called the cane carrier. It consists of an inclined plane, 40 or 50 feet long, formed by a species of bagging, or of a double chain with wooden slats, inserted crosswise, into the alternate and larger links,—the whole forming a moveable band

about two feet wide around revolving cylinders, or band wheels, the cylinders being kept in motion by the moving power of the mill. The plane is formed by this band at an angle of 35° with the horizon; upon which, the canes being laid, in pieces from 3 to 4½ feet in length, are gradually and regularly carried up to the mill.

In the case of vertical cylinders, a person takes the canes as they arrive at the mills, and holds them between two of the cylinders, at different distances up and down. As they pass through, they are turned, round by a circular piece of frame work, which is fixed fast to the upper and lower frames, and is made to encompass the middle roller at the back, and held in contact with it, till the ends are caught by the other roller. The pair of the rollers is adjusted by the wedges of their bearings, so as to be rather nearer than the first pair, because the canes are flattened and crushed by the first pressure between the rollers, and require a still greater degree of pressure the second time they are passed. The space between the rollers does not, in either case, exceed three-eighths of an inch. When the cane is delivered to the horizontal mill, it does not require to be handled a second time after having been placed on the carrier; but, on arriving within a few feet of the mills, it falls into a wooden hopper whose bottom descends at an angle of 45° or 50°, from which it passes by the force of gravity between the rollers. The two lower rollers are placed very near each other, so that the canes are made to pass from the one to the other; but these two rollers, moving in opposite directions, cannot be suffered to come in contact. In this arrangement, it is obvious that the upper roller answers to the middle, and the lower ones, to the two outside rollers of the vertical mill. The canes descending through the inclined trough above described, enter between the two rollers, and are carried forward to the other roller, and thus subjected to a second pressure, without the aid of a returner. The lower rollers are contained in a small cistern, which serves to receive the cane juice, when expressed.

The mill is moved either by cattle or steam power. No wind or water mills are known to exist in the State. Of the relative proportion of the steam and cattle power employed, it is difficult to speak with certainty. In 1828 the number of sugar estates was 691, of which number about 120 were supplied with steam engines. Since that period, it is believed that the number has nearly doubled, leaving, however, the majority of sugar mills still worked by cattle. It is however, probable, that three quarters of the cane are ground by steam mills, as they are invariably used on the large plantations.

When the mill is turned by cattle, the axis of the mill roller, in the vertical cylinders, has long levers fixed across it; the arms

to which the cattle are attached, extending nearly 20 fe et from the centre; and to render the arms firm, the axis of the roller is carried up to a considerable height, and oblique braces of wood, by which the oxen or horses draw, are extended from the extremities of each of the arms, to the top of the vertical axis, thus forming a triangle. Four arms are provided, to each of which a pair of oxen, or of horses is attached. When horizontal cylinders are propelled by cattle power, the upper roller is turned by cogs at one end, which are caught by cogs on a vertical shaft.

When a steam engine is the working power, the gearing is much more compact; in this case, a bevilled cog-wheel gives the motion by being fixed in a horizontal shaft, on the other side of which there is fastened, a large cog-wheel, and this is turned by a pinion fixed upon the end of the axis of the crank or working shaft, of the steam engine.

When the canes have, in the manner above described, passed between the rollers, they are conducted out through an inclined trough, which usually goes through the side of the house, and thus they descend into carts that are constantly in attendance to convey them away to a convenient distance from the house, where they form, in the course of a few years, an immense heap of useless rubbish.*

Defecation.—The cane juice is run off by a spout into two or more large vats, situated in the mill room, near the partition which divides it from the boiling room, sometimes called the laboratory. These vats are rectangular, shallow boxes, made of cypress plank, and capable of holding many hundred gallons. It is not common to find these vats or the spouts leading to them, lined with copper or lead; although it is a precaution which is beginning to be observed by those planters who aim most at neatness and economy in their operations.

Various methods are adopted for the separation of the coarser feculencies of cane liquor, and which consist of pieces of the rind and of the pith, as well as of earthy matter; which last, sometimes adheres to the lower joint of the cane, or which it in some way contracts in being cut and hauled to the mill. Some place a wire seive upon the corner of the vat, through which the sap falls into the reservoir. Others fix a gauze division, vertically across the vats towards the extremity, which receives the sap, and through which it runs, as it flows into the other end, or is drawn off to the kettles. Others, again, in addition to a coarse seive, have recourse to subsidence, drawing off the contents of the reservoir by means of a copper tube bent at right

* The cattle are fond of feeding upon the expressed cane stalk, upon which they soon grow fat: occasionally, they are employed in repairing the levy as they afford a degree of protection from the depredations of the *Craw-fish*, a crustaceous animal belonging to the family *decapoda macrousa*.

angles, one leg of which passes through a stuffing box into the end of the vat next to the boiling room, and even with the bottom of the vat, while the other end is capable of being moved up and down in one direction, so as just to permit the surface of the juice to be discharged: in this way, the insoluble impurities are left at the bottom, and removed from time to time, when accumulated in sufficient quantity. The channels and vats are also cleansed, with warm water, and finally sprinkled with lime or ley from ashes. In very warm weather, this is done once or twice in twenty-four hours.

But the most difficult part of the defecation is effected by the aid of lime and heat. In proceeding to the description of this process, it will be necessary first to explain the kettles and furnaces. These are situated in the boiling room or laboratory, and occupy the centre of the main building. A set of kettles, four in number, is arranged in a line against the main building, on one side, or on both sides, according to the extent. One set occupies a space of about 30 feet in length by 7 to 8 feet in breadth; the tops of the kettles being raised from the floor from 2½ to 3 feet. They are set with the utmost precision in a very solid body of masonry, within which are situated the arches (which give support to the kettles,) the furnace, and the flue which communicates heat to them.

The kettles are made of cast-iron; and are so set as to have their capacity considerably increased by the sloping rise of the masonry above their rims. This rise is about 6 inches, measured perpendicularly, the slope not differing sensibly from 45°. It is effected by using fire bricks of the first quality, ground to one another, so as to make the most perfect joints; and they are imbedded in a peculiar mortar, which consists in part of pulverized bricks. The space thus left between the kettles, which is 14 inches, prevents the contents of one from being dashed into the other, by excessive ebullition; and it also affords space for the construction of arches, which renders the setting more secure. The kettles of a set have different capacities: the diameter of the largest at its surface being 72 inches, that of the next 66, the next 60, and the last 54; or the largest is 66 and the smallest 48; the depth, in every case, being one-third and two inches of the diameter. The names appropriated to the different kettles are as follows: the largest is called the *grande*, the next the *flambeau* third the *syrop*, and the last the *battery*. The grande is at the end next the mill-room, while the battery, of course, occupies the other extremity of the series.

The furnace is under the battery. Its door and ash-pit are upon the out-side of the building. The flue from it passes under the centres of the different kettles; and after having passed the last one, it turns at right angles and proceeds out of the building to the distance of a few feet, when it ascends, in an inde-

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The furnace is under the battery. Its door and ash-pit are upon the out-side of the building. The flue from it passes under the centres of the different kettles; and after having passed the last one, it turns at right angles and proceeds out of the building to the distance of a few feet, when it ascends, in an inde-

pendent chimney, to a height at least equal to the horizontal circuit performed by the flue.

The shape of the furnace is slightly avoidal—its diameter being larger, by about one foot, at the grate than at the battery. The bottom at the battery is situated from 2½ to 3½ feet from the grate. The flue is horizontal at bottom, varying from 14 to 20 inches in height, at its commencement under the syrop, and growing more shallow by a few inches, as it reaches the other extremity under the grande. Its breadth throughout, is five-eighths the diameter of the kettle under which it passes. On reaching the chimney, the flue enlarges to the capacity of 2 feet square, of which dimensions it is continued out to the top of the chimney.

The chimney is carried up double; the inner wall is but 4 inches thick, or the thickness of one layer of bricks; the hollow space between it and the outer wall, being of the same width. The inner wall is tied to the outer, by laying a brick crosswise at each corner, at the distance of every 4 feet: while a 4 inch opening is also left in the exterior wall on each side in the centre of the spaces between the ties, from the bottom to the top, and finally four lateral orifices of the same size at the summit. The consequence of this arrangement is, that the chimneys rarely, if ever, crack, like those constructed of solid masonry.

The grate of the furnace is formed of separate bars, whose extremities rest upon a projection of masonry. The bars are kept apart by means of short lateral projections, at each end, half an inch wide. They are five or six inches deep, one inch wide at bottom, two at top, not including the projections. The more modern grates have bars with projections in the centre also; as it has been found that without this precaution, they are liable, in consequence of the great heat to which they are exposed in that part, to suffer from curvatures.

An opening into the furnace, called the feed-mouth, for the supply of the fuel and the regulation of the fire, is left, whose diameter is about fifteen inches. It is formed by a circular casting, whose interior opening is about twenty-three inches. Its lower side is on a level with the grate. Below the grate is an ash-pit whose depth is not far from three and a half feet, having a rectangular opening, which is situated a little to the right or left of the furnace mouth, in order to protect the fireman from the heat of the coals which fall between the bars of the grate, and often form a glowing pile in the ash-pit.

The casting above described for the furnace mouth is without any door; in consequence of which and its limited size, another casting of different shape has been introduced, to some extent, into the most modern sugar houses. Its shape is rectangular, being on the outside sixteen inches high and twenty-four wide, with two doors, which are made double with an air chamber be-

tween. The bottom of this casting runs horizontally inward, through the side of the furnace, while the top ascends four inches and the sides diverge each four inches. One or both of the doors are open at the charging of the furnace, according to the size of the wood introduced, and which is cut into pieces about three and a half feet long.

In describing the process of defecation, we shall suppose the operation of sugar-making to be in progress. The grande is charged by lifting the gate from the vats in the mill-room—a few buckets of its previous charge having been left in the grande to protect it from cracking on the admission of cold juice. Two or three gallons of its contents are then formed in a milk, as it is called, with from six to twenty-four cubic inches of slacked lime; and the milk is thoroughly stirred into the contents of the grande. As the heat of the juice increases, minute bubbles of air make their appearance, and a greenish, grey scum forms upon the surface of the liquor. When the temperature reaches 200°, the thickness of the scum is very considerable; and it assumes a darker colour. Watery vapour now begins to form, and to force itself through the scum, causing it to crack. This stage of the process is sometimes called *yawing;* and is the signal for skimming. This is done with shallow copper skimmers, ten or twelve inches across, attached to long wooden handles; the scum being thrown into an adjoining vat, whence it is conducted by a gutter to the outside of the building. In some sugar-houses, it is thrown into a vessel provided for the purpose, and allowed to stand in order to give time to the clear part to subside, which is returned again to the grande. The skimming is completed in ten or twelve minutes; when the contents are said to be *clarified*, and are ready to be ladled into the flambeau. If the flambeau is not ready for its new charge, it continues to be skimmed in the grande, while it remains.

Meanwhile, the flambeau and syrop, which are filled with juice that has previously been through the operation above described, are boiling and throwing up scums, that had escaped removal in the first process: these are pushed backwards by wooden oars, over the saddles separating the kettles, (and which are depressed two or three inches for the purpose) from the syrop of the flambeau, and are continually arriving to mingle with the contents of the grande. It is to be remarked that there is a gradual rise from the grande to the battery of a few inches in order to favour this operation of skimming backwards, and although the kettles only, are kept full, yet the ebullition elevates the surface of their contents so as to be even with the tops of the saddles.

The indications of a good clarification are the following: when the juice comes into the flambeau, it should be nearly transparent, and of a pale yellowish wine colour, boiling freely with a

large round bubble, and throwing up its additional fecula, with promptness.

When too much lime, or *temper*, as it is called, is added, the juice has an alkaline smell, and a reddish colour, and boils with a small, flattening bubble: on the contrary, when there is a deficiency of temper, the boiling is not free, and a slimy scum adheres to the sides of the masonry above the kettles.

The variation in the dose of lime, depends upon the ripeness of the cane, and its freedom from acidity. Fresh juice, from perfectly ripe cane, is treated with only about six cubic inches of lime to the grande; but when the cane is green, or frosted, the dose increased to twenty-four inches, and sometimes even to thirty. The quantity of temper required oftentimes differs during the same twenty-fours, on account of some difference in respect to moisture in the lands, producing the cane. Hence, the process of liming is regarded as the most difficult part of sugar-making.

On a few estates, in approximating to the dose of temper, which a particular cane liquor may require, resort has been had to the following plan: a glass decanter, whose capacity is known, is filled with the cane liquor to be clarified, and portions of slack lime, previously weighed out in three or four grain doses, are added, so long as they continue to occasion any precipitation, or the appearance of flocculi. The quantity added to complete this effect is noted, and an estimate is made from it of the weight of lime needed for the contents of the grande—deducting, however, one-fifth of the proportional result in consequence of the preliminary essay having been conducted in the cold, whereas the defecation in the kettle is performed at a boiling heat, in which case, temperature compensates for the deficiency of temper.

In frosted cane liquor, some sugar-boilers employ ley from ashes in place of lime, which they add in the proportion of about one quart, of the highest possible strength, as obtained in the common process of leeching, to the contents of a single grande.

In frosted cane liquor which has become very acid, a few planters are in the habit of relying solely upon heat to produce the defecation.

A method of clarification by steam, is coming into use upon the larger and best conducted plantations. The sap is run off into wooden vats, lined with copper or lead, of the capacity of the juice cisterns, before described, and which they resemble in shape, excepting that they are deeper in proportion to their length and breadth. A copper steam pipe, between two and three inches in diameter traverses, five or six times, the bottom of the cistern, to which it is firmly attached. The cane liquor is introduced, and when the pipes are covered with it, steam is let

in, either from a boiler provided expressly for it, or from the boilers of the engine, or it is the escape steam which is employed. The temper is now added; and the access of steam maintained, until the yawing occurs, when it is shut off, and the scums are immediately removed, or the juice is left until nearly cool, to be drawn off by an orifice situated within one inch of the inner bottom of the cistern through which the liquor is suffered to flow so long as it continues to run clear; after which it is closed, and the remaining portions are let off by another cock placed parallel with the inner bottom into casks, from which, after some hours of repose, about half of their contents is drawn clear. The clarified liquor is run from these vats (commonly two or three in number) into a general reservoir near the grande, traversing in its progress a course bagging filter, interposing for detaining any portion of light flocculent matter that may have escaped the previous process. From the reservoir it passes to the grande, and in boiling is skimmed and ladled forward as before described, more lime being added, if appearances indicate that there is not enough; and on the other hand, more fresh juice, if too much has been added.

(*To be continued.*)

Art. XLV.—*Topping and Leafing of Grape Vines; by* W. W. B.

[FROM THE GENESEE FARMER.]

Topping and leafing of vines in the summer after the fruit is formed and partly grown, is practiced by some with a view to the maturing and perfecting of the fruit. Experience has convinced me that it is a bad practice, and one calculated to produce the contrary effect. The past season my vines were loaded with fruit. An arbor over which four luxuriant Isabellas spread, contained several bushels. Though the vines were not very thick, I thought, perhaps, it might be of some advantage to the fruit, to give it more exposure to the sun by not only cutting off the side shoots, but topping the branches and thinning the leaves. Topping the fruit branches, I supposed would increase the size, and forward the ripening of the fruit, by giving it a greater share of the juices which otherwise would be spent in the production

of wood alone. I accordingly topped the fruit branches mostly on one side of the arbor about two joints above the fruit when the fruit was half grown; as the season advanced, when the fruit was nearly grown, but before it began to turn, I thinned out the greater part of the leaves at the lower part of the arbor, so that the fruit was quite exposed to the sun. My good spouse, looking out of the window, shook her head at me and desired me to desist, protesting that it was wrong; for the leaves were not given in vain to the plant; that they were undoubtedly of material use, necessary for the perfection of the fruit, or they would not have been given. The result was, the fruit on those branches which had been deprived of their top and part of their leaves grew very little more, and did not ripen as soon as the others, and was very inferior in flavour to that which grew on the branches from which no leaves had been taken. My wife who looked only at the reason of the thing, was right, and I was wrong, as the result proved. The leaves undoubtedly perform the important office of preparing the juices for the fruit, separating from the sap that part of it which is necessary for the fruit's perfection. Hence, to deprive the branch of its leaves by topping and leafing, cuts off the necesary supply from the fruit. I pretend not so much knowledge in this branch of horticulture, but am of opinion that the only summer pruning which is useful to the grape vine, is the cutting out of supernumerary branches, and breaking off the side shoots so as to leave the vines sufficiently thin to admit the sun and air. If the vines run thick together, the fruit is deprived of the influence of the sun, and is sour and insipid; hence the importance of thorough fall pruning. I observed another injurious effect from this topping and leafing the the fruit branches; the wood of those branches, when I came to prune in the fall, was soft, spongy, and very imperfectly ripened. I might have anticipated this effect, had I but reflected a moment upon the laws of vegetable physiology. The upper part of the branch and leaves are as necessary for the perfection of the wood below, as of the fruit. The result of this experiment is another fact, which, reasoning from analogy, shows the absurdity of the practice of topping corn before it is ripe. The grain is undoubtedly the loser by it. W. W. B.

ART. XLV.—*Process used by C. Vaughan, Esq. in the Making of Cheese.*

1st. If possible, to make a cheese at each milking.

2d. To heat a small quantity of the milk, so as to bring the milk taken from the cows to the heat of 96°, which is the temperature of the milk as it comes from the cow.

3d. To use liquid rennet, and to make the cheese of equal quality. The rennet should be prepared the first of the season and kept in small bottles; and it being of equal strength, it ought to be used by measure, according to the gallons of milk to be turned.

4th. When turned to a curd, a wooden knife should be passed across the curd in the tub, and when the whey is properly separated it should be placed in a basket, in which a strainer is first placed.

5th. When strained, it should be broken up into small particles, but not hard squeezed, and then salted, and put into the cheese hoop.

6th. It is then to be put into the press, and the pressure to be gentle at first, and gradually increased, and turned twice each day; the last pressure may be considerable. In this manner the rich part of the cheese is kept in at first, and at the last the moisture is pressed out, which in the common mode is dryed out, by time.

7th. The cheeses, after they are taken out, should be put where there is air, and where the flies cannot get to them, and turned and rubbed over twice a day. They ought to be rubbed with butter—some used fat pork. The cheeses treated in this manner have been better fit for use in three months, than common cheeses in nine months.

The press best fitted is a lever or beam press made out of timber seven or eight inches square, and ten feet long. The end secured by a strong pin between two upright pieces, and when parallel with the bench it is over, it should be as far apart as to admit the largest cheeses that may be made, with the follower to go under at the heel. The cheese when first put under, should be put as far from the heel as possible and light weighted—every time it is turned it should be put further under, and the fourth time, which is the end of the second day, it should be as near to the heel as possible.

When two cheeses are made in a day, they were put into one press. There is a simple and new kind of press which is said to have the quality of pressing as much or as little as is wanted.

There are several English receipts for preparing rennet. The rennet one season was prepared by soaking the bags in brine, and all the liquor was then mixed and put into small bottles, well corked and kept for use.

Art. XLVI.—*On Ploughing.*

[FROM THE MAINE FARMER.]

As this is the season for using that invaluable instrument—the plough, perhaps, it may be well to call the attention of our farmers to the subject. There seems to exist quite a diversity of opinion in regard to the proper depth that land should be ploughed. Many, and in our opinion too many, advocate shallow ploughing. "What's the use, say they, of ploughing up the pan and burying the manure and the soil out of the reach of the plant?" "Let us reason together." What's the use of ploughing at all? Is it not that we may pulverize the soil and bring it to such a state that the little roots and fibres of the plant may shoot out easily and gather up whatever it can find to nourish it? Is it not to incorporate the manure with the soil and make it of an uniform consistency as it regards quality, &c.

Now the deeper you make the soil, the deeper will the roots plunge, and the deeper and more extensively the roots plunge, the more nourishment will they be likely to find, and the less liable will they be to injuries from drought. Plough deep—dont fear burying the manure so deep that the roots will not find it—they will go as deep as you can by any plough ever yet made. It is possible that you may not realize so good a crop the first year by burying the manure deeply, but you will not lose it, and the next year you will have a deeper soil—and in a short time, your land will of course, be worth double depth of soil. What makes the intervals and bottom lands so much better than most uplands? Is it not depth of soil? Aye, but nature made that. Take nature's advice and make yours so. If nature has made a plough of the elements and buried her vegetable matters deep, and made a soil tenfold more valuable for it, follow her example. She did not do it all at once, neither need you, if you are not able. If you think you have not manure sufficient to make such a soil the first year, or must have the benefit of it immediately, act accordingly, but begin immediately. If you can

plough but four inches this year plough six the next, and increase annually till you get the soil deeper than you can get the point of your plough. We may appear somewhat dogmatical in our advice, but that is of small consequence provided we can dogmatize some into the practice, who are now utterly opposed to it. What runs a farm out, as it is called? Is it not shoal ploughing, a scratch over the soil as if you were afraid of getting out of the reach of the sun and air? We verily believe this is the principal cause. The remedy must be the reverse course of management.

Art. XLVII.—*Upon Exact and Experimental Agriculture; by* Henry Colman.

The following piece ought to have been published in the February Number, but was accidentally mislaid until now.—*Ed. So. Agr.*

(Concluded from page 53.)

Next to exactness is another matter intimately connected with it and of like importance to an improving agriculture, that of making experiments. You are two intelligent to indulge in the senseless clamour about agricultural experiments and experimental farmers. You know that in agriculture all knowledge is the result of experiment, and those are esteemed the best farmers, who have had the most experience and the longest practice. But perhaps you will say, let the rich make experiments, we have not the means. This is not so; and the farmers of moderate circumstances, and who work in their own fields, are the very persons to make the experiments, because they are better able to watch the result; and, as they cannot afford to lose and are most concerned to make their agriculture profitable, will feel the stronger interest in the progress of such experiments.

Now very extensive or expensive experiments are not what we recommend to farmers of small means; but small experiments are perfectly with their reach, and the instruction to be gained from them on a small scale may be equally valuable and decisive as from those on a large scale. The effect of lime upon your farms, or upon the different soils to be found in different parts of them; applied to corn or wheat, to potatoes, to grass; used in its air-slacked or un-slacked state; how to be applied; when to be applied; all these are very important inquiries; and

may be as easily ascertained by the use of a single cask, which may cost you a dollar, as by the use of fifty; and in any event you are certain that the lime is not wholly lost. So too with gypsum and ashes. Some of the most important points in regard to the application of these powerful manures remain to be settled by experiments. The result of such experiments may be of great importance to you; how are they to be applied; in what quantity, at what season; in what form, to what crops; under what circumstances they lose their efficacy; what kinds of plaster are to be chosen, the dark or the pink coloured; how ashes are to be applied, whether leached or unleached; the comparative value of wood-ashes, and of peat-ashes, with which your county abounds; all these important points can be determined only by experiment; and these experiments on such a scale as to decide them may be made by the smallest farmers and at almost no expense. So too as to the application of other manures; by the most simple experiments and without cost you can decide for yourselves the long mooted questions, whether manures are best applied in a green or a rotten state, in the hill, or spread, and buried by the plough or scattered on the surface and barely covered with a harrow.

So likewise in regard to your crops:—you can as well ascertain on a quarter of an acre as on a quarter of an hundred, whether your soil will bear wheat or not, or by the application of lime or soaper's waste, may or may not be made to bear it; whether the autumn or the spring wheat is best for you; whether your corn or potato crops were better planted in hills or in drills, and at what distances; whether your grass seed may better be sown in the fall or the spring, by itself or with other crops; and whether after a fair trial of the expense and value of the produce you would find it for your advantage to cultivate for the feeding of your stock large quantities of vegetables, such as potatoes, carrots, or turnips; or to confine yourself to Indian corn and grass. These experiments would lead, if carefully conducted, to most valuable results, and for all practical purposes, are as much within the power of the farmer in moderate, as the farmer in affluent circumstances.

Next in regard to your domestic animals: do not be offended if I ask you, how many of you can tell me, how much hay and provender it requires ordinarily to keep a horse? How much a yoke of medium sized oxen, worked or not worked? How much a common milch cow? How much your yearling and two year old heifers and steers? And how near their labour, their produce, or their growth comes towards defraying their cost? These animals are kept at great expense beyond a question. The keeping of them a part of the year is not necessary for their labour to all of you, nor for their manure to some of you, who can procure this article in abundance either from the sea shore or from

the neighbouring livery stables. These, then, are most important points, which can only be decided by actual experiment; and such experiments require more than a little trouble or attention, in measuring their food for a certain time. Very few of you would, I believe, be able to answer these questions with any thing like certainty. The amount of hay, for example, required for wintering a cow is estimated by different individuals at from one and a quarter tons to two tons and a quarter. This, where hay is a cash article, is a very important difference; and though there will be differences in the size and appetites of different animals, yet most certainly we might more nearly than that, approach the determination of the quantity. So too with respect to feeding of oxen and horses, not only as to quantity but the kinds of feed which may be most profitably applied, corn fodder, English hay, salt hay, corn, meal, oats, food cooked or uncooked, many queries arise, which can only be settled by experiments, careful experiments; and may be settled by experiments, which would cost nothing.

In regard likewise to the keeping of swine, every farmer who keeps one may soon settle for himself by actual experiment, the often discussed question of their profit or loss; and other points of equal importance relating to the kinds of food, which may most profitably, if profitably at all, be given them.

These, and such experiments as these, I recommend most earnestly and most respectfully to the Essex farmers, to make and to repeat and to report. The results of them and the faithful and exact communication of those results to the public through the Society, will be of the greatest benefit both to individuals and to the community. In my opinion the Society could not better appropriate some portion of their funds, than in the encouragement of such experiments by giving, where they are well conducted and fully detailed, whether successful or not, such pecuniary gratuities to those, who conduct them, as in their judgment they may merit; and as shall stimulate them to further inquiries, though such objects of premium are not from the necessity of the case, previously promised in their publications.

Facts in agriculture are the instructors, which are most needed. The advances of the science have been necessarily slow; but who can doubt that there are yet many more truths to be discovered, other mysteries in nature to be solved; the much more light to break forth on a subject so essentially connected with human subsistence and comfort and the general welfare. He who assists to settle the most simple truths, and to solve the least of these and other controverted points, is to be deemed a public benefactor. He who brings but a single pebble to the heap, may feel a just claim to his share in the honour of contributing to the substantial foundation on which the subsistence of animal life, the exercise of all intellectual and moral energy, and the im-

provements and comforts of human society primarily and mainly depend; agriculture, the mother of all the arts and the basis of all national prosperity.

HENRY COLMAN.

Art. XLVIII.—*On Pumkins; by* C. B.

[FROM THE GENESEE FARMER.]

I am not much of a farmer, my own time having been occupied for many years in other business, so that I have not had those opportunities for making experiments in agriculture that are calculated to advance the interests of said science. It was nevertheless my good fortune some eight or ten years ago, to procure some seeds of the pumkin, the culture of which has proved so peculiarly advantageous, that I am anxious to call the attention of farmers to the subject. No doubt these remarks may excite a sneer from many of your sagacious readers, who will lay by the paper in contempt, and say, "who does not know all about a pumkin?" The man from whom I procured the seed possessed rather a facetious turn, so that in his recommendation of his pumkin seed, I at first apprehended that he was indulging in that merry propensity, as he remarked that they would grow in so long a shape that a man might carry one on his shoulder with the same facility that he could a stick of wood or a rail. When my pumkins came to maturity, I found there was too much truth in his remarks to be all a joke. They will sometimes grow to the length of from 20 to 30 inches, and perhaps a foot in diameter. Their peculiar advantages over the common round pumkin, consist not in their shape. The substance of them is thicker, of a finer texture, and very evidently sweeter than the other kind. The space containing the seeds is small in proportion to the size of the fruit, and consequently they are proportionably heavier. Some of them have weighed over sixty pounds. I have not failed a single year of raising a luxuriant crop; and a neighbouring farmer who procured some of the seeds of me, and used it two seasons, assured me that it had proved a nett gain of more than $20. It is a true maxim, that "what is worth doing at all, is worth doing well." So, although the subject of my communication is a pumkin, if it is worth raising, it is certainly best, if there be any choice in the seed, to select the best and

cultivate it in the best manner. In cultivating the pumkin, I have usually followed the example that has been set me by neighbouring farmers, and planted the seed along with that of my corn. Two years ago a circumstance occurred that has caused me to doubt if that is the most economical method. A pumkin plant came up by accident near the door of my dwelling, and was discovered by a little boy, and mistaken by him for a plant of a watermelon, and by him transplanted among the tender vines in the garden. It so happened that the bugs or some other blight destroyed the other vines near it, so it had ample room to develope itself in all directions; the consequence of which was, a crop from this one plant that weighed 215 pounds. Now it must so be, that the luxuriant crop of vines that is produced among the hills of corn, must diminish in some degree, the crop of corn. So the question would arise whether it would not be the most consistent and profitable mode to plant them in fields separate from other crops? Perhaps some of your numerous readers have tried the experiment. C. B.

Phelps, April 17, 1834.

ART. XLIX.—*On the use of Dutch Ashes as Manure; by Mr. John Mitchell, jun. Leith.*

[From the Prize Essays and Transactions of the Highland Society of Scotland for the year 1833.]

In a short communication sent to the Society some time ago, I endeavoured to bring under their notice a very valuable and cheap species of manure, which, on a late tour made by me on the continent, I observed was much prized, particularly in Flanders. I then placed at the disposal of the Society twenty casks (about seven tons) of the substance in question, which have been delivered free of any charge to several noblemen and gentlemen, eminent agriculturists, who will have an opportunity of trying their efficacy.

When in Flanders, I found the farmers generally complaining of the serious injury they were likely to sustain in consequence of being almost entirely deprived, from interruption of the communication with Holland, of an article which they considered essentially necessary to their domestic economy, namely, *Dutch ashes;* and as that article can be imported at a very mo-

derate price, it is of importance to consider how far it may be proper to introduce it into this country.

In Holland, there are two kinds of turf or peats used for burning, namely, those cut as in this country from the bogs, which burn easily, but give a whitish kind of ashes, which are of little use; and another kind, more generally used, as being more durable. Having witnessed the mode of making this kind, I shall here describe it. At those ditches or ponds made by cutting away the common peats, or upper parts of the bogs, men were employed in dragging from the bottom, by means of long sticks, having hooped bags at the end, the soft portion of the peat under water. They poured it out on the adjacent ground, when the water was allowed to drain off. After exposure to the air, this substance becomes in a few days sufficiently consistent to be cut to pieces of the size of a common building brick, which are died for the use. The ashes from this kind of peat are of a yellowish brown colour, and are the kind so much prized in Flanders: carts go regularly round to the various houses, where this turf is used, and carefully collect all that can be obtained. When the communication was open with Belgium, the ashes were sent by water to Brussels and other places in that country, and, after a long water carriage, they were often conveyed fifty, and even a hundred miles farther by land.

These ashes are used in various ways in Flanders. They are generally sown upon clover, at the rate of twenty-five cuvelles per hectare, equal to about nineteen bushels per acre, imperial measure. They are sown on clover, wheat, and pastures, in March and April; on oats and beans in the beginning of May; on rye in October and November. They are also used in gardens with great benefit to the crops, by being scattered over the surface, after the land is sown and raked. They are also good for hops, a handful being given to each plant. When applied to grain, they promote its early growth; but are principally useful in increasing the quantity. They are generally sown by the hand like grain, but care must be taken to leave no part of the surface without its just proportion.

In Holland the mode of applying them is as follows. In March, the wheat is worked with the hoe between the rows, and sown with clover; and in May, the rows of wheat are weeded. The wheat being reaped, and as soon as the danger of floods is past in the spring, the land is harrowed, and thereafter they strew about twenty imperial bushels on the acre of clover. This practice is greatly recommended, and found to be highly advantageous.

An eminent Dutch agriculturist, F. L. W. Brakkel, in a work lately published by him at Utrecht, points out the advantages of using Dutch ashes on the clover in this way, his alternation of crops being potatoes, rape seed, peas, wheat, clover and oats.

Another writer on agriculture, J. R. Schwarz, says the ashes must be used in their dry state, and thinly strewed, and on ploughed land must be harrowed in before or at the sowing. They are of most use on cold wet grass lands to dry the ground, destroy the acidity, and kill the mosses. They are so much persuaded in Belgium of the great use of Dutch ashes, that the farmers have the following proverb: "he who buys ashes for clover, pays nothing; but he who neglects doing so, pays a double price." The great advantages to be derived from this practice are also pointed out by Sir John Sinclair, in his tour in Flanders, and many other testimonies might be adduced in its favour.

By an analysis made by Professor Brande of the Royal Institution, the contents of the specimen given him were:

Silicious earth, - - - - - -	32
Sulphate of lime, - - - - -	12
Sulphate and muriate of soda, - - -	6
Carbonate of lime, - - - - -	40
Oxide of iron, - - - - - -	3
Impurities and loss, - - - - -	7
	100

The great advantages which the Dutch ashes hold out to the farmer are, their being a cheaper, and (at least for some purposes,) more certain and beneficial manure, than any now in use. They can be easily transported to a great distance; they give a greater number of bushels to the ton than bones or rape cake, and they are only about half the price per ton of either. It has also to be remarked, that bones are getting scarce abroad, and are rising in price. Besides, the Dutch ashes require no previous expense or preparation in this country, but can be immediately applied after being landed; whereas, bones and rape cake have to undergo the process of grinding, before they are fit for use.

As a top dressing, these ashes are superior to common manure, it having been found, on making comparative trials in Flanders, that the crops of clover, where the ashes were used, were much earlier, heavier, and superior in every respect to those which had undergone a top dressing of horse and cow-dung. As a top dressing to the second crop of clover, they will he found highly advantageous, as by being used this way, they wonderfully increase the rapidity of growth and produce. One of the best proofs of their usefulness is the fact, that while we have frequently in this country very backward and light crops of clover and grass, in Flanders, where this top dressing is used, such a defection seldom if ever occurs. They are, therefore, likely to be of great use to the farmer on lands which have "grown sick

of clover;" and the importance of having a good crop of clover is the more obvious, when it is considered that, in general, the succeeding crop of wheat is only good when the preceding crop of clover has been so.

Besides fertilizing the land, the ashes may be of great advantage in preventing the injuries arising from worms or insects; and will no doubt be highly useful as a top dressing, if regularly persevered in for a certain time, in destroying the mosses and litchens so apt to injure the lawn and natural pasture in this country.

I have found a bushel of these ashes to be about 40lbs. in weight. The ton, therefore, consists of about fifty-six bushels. At 3*l.* per ton, which will be the price from the shop, free from every charge, the expense of manuring an acre will only be about 1*l.* [or $4 80.]

ART. L.—*On Draining.—Addressed to Young Farmers.*

(Continued from page 274.)

Streams of the second class, having sufficient fall, are generally such as flow through a hilly country. The low grounds, or bottom lands, lying on the borders of such streams, form a large proportion of the best natural soils of lower Virginia. Indeed but few other soils are richer than these have been, or would be more productive, if they had been properly managed: but the general treatment of such lands has been so injudicious, that they have yielded but little nett product, and in many cases have become nuisances, and a source of loss instead of profit. I allude especially to low grounds on small streams, not exceeding the size sufficient for an ordinary mill. Some of the usual and barbarous practices will be pointed out for avoidance, and also because their effects now present some of the worst obstructions to a proper plan for drainage and cultivation.

The bottoms through which the streams run, have been entirely formed during past ages by the earth washed from the higher lands by heavy floods from heavy rains, and deposited so as to form a nearly level surface. Of course the greater part of this deposite has been made from the main stream, and at the times when it overflowed the whole low ground. But it is not only during such floods that the operation is going on. At all times

a shallow running stream is bringing down earth, and thus raising its own bed, until it leaves it for another and lower place, or when a flood comes, throws the accumulated sand out of its choaked channel, over every place low enough to receive an accession. Thus, by the tendency of the overflowing water to cover mostly the lowest land, and from the greater subsidence of the suspended earth, where the water is most deep and still, nature works contiuually to keep such lands level from side to side. Before the adjacent hills were cleared and subjected to the plough, there could have been no great supply of earth, except from the richest soil on the surface—and that was furnished slowly and gradually.

Rich as these narrow bottoms were, our fathers did not readily undertake to drain and cultivate them. Before this was done, the adjacent high lands had in most cases been cleared, cultivated, and washed into gullies—and had served to throw upon the low ground more of barren subsoil in a year, than it had before received of rich mould in ten. Nor was this injurious deposite brought down by the principal stream, and spread over the whole surface. It mostly was brought by torrents of rain water, which for a little time swelled the rivulet to a flood, and by which the sand or gravel was carried out on the rich bottom soil, in points projecting from the ravine through which the torrent rushed. These points of sand, by their thickness and poverty, now form one of the greatest difficulties in draining and cultivating the low grounds.

The management of the neighbouring highland, so far as its washing is promoted or prevented, is one of the most important things bearing on the alluvial bottom below. If no mischief had been already produced from this cause, the instructions that will be offered would be more simple, and yet far more serviceable. Prevention is always better than cure—and in these cases, the perfect cure is impossible. We have destroyed the greater part of the value of our low grounds, before we knew their productiveness.

Next come the injuries inflicted directly when such lands are under cultivation.

Bottoms of the kind under consideration are generally from 150 yards wide, to the narrowest size worth draining—meandering continually in their course—and having sufficient fall or inclination to give a rapid course to the natural stream, and to allow the land to be effectually drained for cultivation. The stream is still more crooked than the valley through which it runs, and is often twice as long as would be the straightest course that might be given. Nor is the course of the stream always through the lowest part of the land—for the margins of the stream are often the highest parts, owing to the more plentiful deposite of sediment when the overflowing waters first rise over their banks.

The first error usually committed is to leave the stream (if a large one) in its natural crooked bed, instead of giving it a shorter course: the next is, to impede still more the course of the water by allowing thickets of briars and shrubs to stand on the edge of the stream, and every kind of rubbish to be thrown into it. The crooked and choaked channel causes the stream to overflow with a rain that would not swell the current injuriously, in a clean and straightened bed, though of no more average width, and occupying not one-fourth as much land. The land lost is not only the bed and banks of the stream. A very crooked course makes it impossible for the plough to run in the same direction: and many points of land are formed too narrow to be worth cultivation. Hence a wide margin is left to grow up in thickets, and to harbour musk-rats and other vermin—or to be kept cleared at more than twice the cost of proper cultivation. If the stream separates the lands of two proprietors, (as is one of our common follies,) the evil is far worse. If either cleans his margin effectually, and opens the stream, it will avail but little, while his neighbour uses no such care. In the mean time, with every heavy rain the obstructed current sweeps across the land, tearing away the ploughed mould, or covering it with its load of sand. The soil thus swept off serves to fill and render useless the cross drains made to convey the smaller streams. Every such flood saturates the soil with water to the great damage of the crop, and leaves the whole a picture of desolation.

Next let us examine the side, and cross ditches. In hilly and sandy lands, small springs ooze out of the hills so frequently along the side of the low ground, that there is almost always a necessity for a ditch on each side, to intercept them. The side ditches (unless they are covered or hollow drains, which will be treated of hereafter,) if bordered by cultivated land, are perpetually filling from the washing hill-side soil: and the difficulty of keeping them open is still more increased, where they cross the points of sand brought down by former currents, and which are still increasing from every torrent of rain water. It is not strange, therefore, that the side ditches are seldom clean: and though they obstruct, they seldom entirely prevent the oozing waters finding their way to the low ground. Where the valley is narrow, or the main stream small, one of the side ditches is often made also the main carrier, or channel of the stream. This is a great saving, if the ditch is straight enough, and so situated in other respects as to be kept open, and deep: but otherwise, the side of the low ground is the worst location for the main stream.

Cross ditches are used to bring the water of a side ditch to the main stream, when it can no longer be continued down the side: or they lead from low places which though not exposed to spring water, would be made ponds by receiving the surface water from rains and floods, and would remain so until the water was soak-

ed up by the absorbent earth. The beds in which the land is cultivated usually lead to these cross ditches, and their water furrows there vent the water that collects in them. As the cross ditches fill rapidly from the causes already stated, their repeated cleanings soon make a dike not only on *one* side, but on *both*, unless more judgment is exercised than is common. Then the ditch, when well open, may draw water from its head to its outlet: but not a drop can enter it along its whole course, so well is it defended by the bank of earth on each side.

(*To be continued.*)

PART III.

MISCELLANEOUS INTELLIGENCE.

On Suckering Corn.—I had the pleasure, about four years ago, to spend a day in company with old Mr. Macon of North-Carolina, when our conversation was principally on subjects of agriculture; and among others, the cultivation of Indian corn. After having inquired whether I had the suckers which grew from the roots of corn pulled off, as is the common practice, and received my answer in the affirmative; he informed me, that he suffered them to remain, having from repeated experiments, ascertained that they did not injure the corn; but on the contrary, the suckers more frequently than otherwise produced good ears of corn; and that if they failed to do so, there was an increase of fodder. I have since tried the experiment and witnessed the following results. That after carefully examining the ears of corn on the stalks producing suckers, they were found to be as good as the ears on the surrounding stalks not producing them—that a large majority of the suckers produced good corn, though the years generally, were smaller than those on the mother stalk, and that (of course) there was an increase of fodder. Without entering into an inquiry, whether corn ought not to be planted so thick, as to prevent it producing suckers, (if thick planting will prevent it, of which I am not sure,) or whether the pulling them off, may not injure the corn, by inflicting wounds on the stalks; I can now safely recommend Mr. Macon's practice, as saving the time and labour of pulling off suckers, and what is of more consequence, as producing an increase of the crop of corn and fodder. I ought to add, that none but the suckers growing from the roots ought to be suffered to remain.

W. M. Watkins.

Charlotte County, March 20th, 1834.—*Far. Reg.*

Diseased Horses.—Messrs. Tucker & Co.—I have read the remarks of *Onondaga*, in the Farmer of Dec. 21, respecting the black tongue, and the doctoring of horses generally. I am pleased with some of his observations, but I think he is mistaken in some things. In speaking of the pulse of the horse, he says that fifty to a minute and upwards, indicates a high fever. So says I, if enough upwards of fifty. The pulse of a horse in good health, with low feeding, beats from thirty-six to forty per minute: if high fed, his pulse may go forty-five, and some more, without any more fever than is occasioned by the high feed. In simple and symptomatic fevers, the pulse will run from sixty to seventy-two, and in cases of inflammation of the lungs or pleura, in the early stage of the disease, the pulse is often from sixty-two to eighty, when nothing but excessive bleeding with continued clysters, will be of any service.

The best place to ascertain the pulsation of a horse, is under the jaw-bone, where the artery passes on to the side of the face. In this situation the artery is covered by the skin only, and as it rests against the bone, its strength or weakness may be ascertained with the nicest exactness and accuracy. When a horse is in health, the artery feels neither hard nor soft, but perfectly elastic; but, when in a fever, the artery becomes often so hard, as to resist the pressure of the finger, and will beat, as said before, from sixty to eighty a minute.

As there is nothing like comparing notes to come to the truth, I wish you to give the above a place in your Farmer. A Scotchman.—*Gen. Far.*

Hunting Bees.—The manner of hunting bees, as practised in the new settlements, may be familiar to many of the readers of the Genesee Farmer, but perhaps not to all. As advantage is taken of a peculiar instinct, it would, I think, be interesting to those unacquainted with it, to be informed of the process.

A tin box is provided, capable of containing about a pint. Into this is put a piece of dry honey comb; a bottle of honey and water, mixed about half and half, is also provided. The honey is diluted, in order that it may be more readily poured into the dry comb—that the bees may not be so liable to get it upon their wings, and will be able to fill themselves the more expeditiously. Apparatus for making a fire may also be necessary. With these, the hunter proceeds to a newly cleared field, at a distance from any hive of domestic bees, and having poured a little of the composition into the comb, he proceeds to search among the wild flowers for a bee. If one can be found, he is caught in the box by shutting the lid over him. As soon as he becomes still, the lid is carefully removed, when he will be found busily filling himself with honey. When he rises he must be watched, in order to ascertain his course. After making one or two circuits about the box, he will fly off in a straight course to his home. After an absence of a few minutes, say five or ten, he will return, *bringing with him two or three of his companions.* These will soon fill themselves, go home, and return again with a number more. Thus they will continue to increase in number, till in the course of half an hour there will be one hundred or more in the box. By that time the line will be ascertained with precision. The lid is now shut over as many as possible, and the box is removed on the line to the edge of the woods, where it is again opened. The line will soon be found at the new station as before, and thus the box is removed, from station to station, until the tree is either discovered or passed. If the tree be passed, the line of course will be retrograde. A small pocket spy glass is a convenient thing for searching the tops of trees, as it requires a good eye to see a bee at that distance If a bee cannot be found to commence operations with, a little honey is burnt on a stone. and if a wandering bee happens to be near, he will be attracted by the smell.

The proper time for hunting bees, is on a fair warm day in the month of September or October. During the summer months, when food for bees is to be found every where they will not *traverse*. If a bee tree is in the neighbourhood of a sugar camp, bees will be found about the tree in the time of making sugar. They will traverse well in the spring.—*Gen. Far.*

On Harvesting Wheat and Rye.—The most of our friends being agriculturists, something relative to their business and pursuits, is very apt to find its way into their letters; and in looking over some that were written in years past, we found the following paragraph, which we think may be profitably laid before our readers. If an apology for presenting it so long before harvest, were necessary, we might possibly find one; but to him who is in search of knowledge, no season is inappropriate when he can bring it within his grasp; and doubtless his memory will be too tenacious to lose any thing valuable in the brief period of four or five months.

"It is a common opinion that both wheat and rye make better flour when cut before they are fully ripe; but from some experiments made in this neighbourhood, it appears to be founded in error. *The wheat which stood until fully ripe, weighed* four pounds *to the bushel more than that which was cut early.* It was also much more easily threshed; a matter of some moment to to the farmer; and as it grinds easier, it requires less water on the wheel."—*Gen. Far.*

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Rearing Calves.—The following is the general method of rearing calves in Britain, and differs not materially from that followed by Bakewell, the great cattle breeder.

"The calves sucked for a week or fortnight, according to their strength; new milk in a pail was then given a few meals; next new milk and skim-milk mixed, a few meals more; then skim-milk alone, or porridge made with milk, water, ground oats, &c. and sometimes oil cake, until cheese making commenced, if it was a dairy farm; after which whey porrage, or sweet whey, in the field, being careful to house them in the night, until the warm weather was confimed. Bull calves, and high-bred heifers, however, were suffered to remain at the tile until they were six, nine, or perhaps twelve months old, letting them run with their dams, or more frequently less valuable cows or heifers."

It is to be remarked, that they have no Indian meal in Britain. This is substituted with us, for oat meal, and even oil cake. A handful put into skim-milk or whey, for calves improves their condition greatly.

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Lime—Has been found by chemical analysis to compose a very considerable portion of the kernel of wheat. It has also been found that any considerable quantity of animal manure, applied to land where wheat is sown, has a tendency to cause it to grow rapid, and of course the sap bursts out, and it rots, as we call it; and when this takes place the kernel becomes shrivelled, and is rendered nearly useless; and no human means can prevent it, if we enrich our land largely with animal manure. A previous clover crop ploughed in is enough to cause wheat to grow sufficiently large, unless we wish for straw instead of kernel. This cannot always conveniently be had when we wish to sow wheat. In such case it is desirable to place something on the soil which will cause it to grow, and not surfeit it. We learn that in Great-Britain, nothing has succeeded so well as lime. The farmers there, within fifteen years, have by the proper use of lime, been able to procure 30 or 40 per cent. more of the golden crop than formerly.

Why may we not use it to as much advantage? It is found among us plentifully, even in this town, if not so pure to use for plastering, yet abundantly so for to make wheat grow well. Therefore, I propose that you, Sir, or some one else, draw up a subscription paper, inviting our farmers to subscribe something, that funds may be raised to dig, burn, and prepare some of it for use early in the spring. I will not believe that we shall be unwilling to make the trial. I have made these suggestions and surely shall need do no more, except subscribe something to procure workmen, &c. there being no doubt the owner of the rock will be glad to have the trial made. EXPERIMENT.

Winthrop, Dec. 9. 1833.—*Maine Far.*

The great Pyramid of Egypt cost the labour of one hundred thousand men for twenty years, exclusive of those who prepared and collected the materials. The steam engines of England worked by thirty-six thousand men, would raise the same quantity of materials to the same height in eighteen hours.

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Luminous Plants.—In the case of the rizomorphæ, there can be no mistake. These curious plants are found in subterannean cellars and mines, and illumine the darkness which surrounds them with their magic light. In some of the coal mines of Dresden they are singularly beautiful and brilliant. Mr. James Ryan once informed me that he was accidentally shut up in a mine, and the light of one of the rizomorphæ was so brilliant that he could see distinctly to read a letter by it. As the rizomorphæ prey on dead wood, they impart to it a phosphorescent light. The rizomorphæ phosphorentia is found in the mines of Hesse, and yields light in the dark, but ceases to be phosphorescent in hydrogen and some other gases: the rizomorphæ subterrannea and acidula have also been to illumine the mine with their fairy light. Mr. Erdmann thus describes the luminous appearance of the rizomorphæ in one of the mines of Dresden: "I saw luminous plants here in wonderful beauty; the impression produced by the spectacle I shall never forget. It appeared on descending into the mine, as if we were entering an enchanted castle. The abundance of these plants was so great, that the roof, the walls, and the pillars, were entirely covered with them, and the beautiful light they cast about almost dazzled the eye. The light they give out is like a faint moonshine, so that two persons, near to each other, could readily distinguish one another. The light appears to be most considerable when the temperature of the mines is comparatively high." That the light is electric seems most probable, when we consider that an electric discharge imparts phosphorescence to Canton's phosphorus (calcined shells,) and that heat enhances the light.—*Murray's Physiology of Plants.*

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On the benefit derived from frequently Stirring the Earth about Growing Vegetables.—Plants are very much benefited by having oxygen applied to their roots, being found to consume more than their own volume of that gas in twenty-four hours; and when applied by Mr. Hill, to the roots of melons, hyacinths, &c., the first were found to be improved in flavour, the second, in beauty and in vigour. Every thing that promotes the presentation of oxygen to the roots of plants, must be beneficial.

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Novel Effect of Oil on Water —The following is a secret worth knowing; in rough weather they (the fisherman of the Bosphorus) spread a few drops of oil on the surface which permits them to see clearly to a great depth I was aware that oil would calm the surface of the sea, but until recently I did not know that it rendered objects more distinct beneath the surface A trinket of some value had been dropped out of one of the upper windows of our palace into the Bosphorus, which at this place was ten or twelve feet deep It was so small that dragging for it would have been perfectly fruitless, and it was accordingly given up for lost, when one of the servants proposed to drop a little oil on the surface. This was acceded to, with, however, but faint hopes of success. To our astonishment, the trinket immediately appeared in sight, and was eventually recovered.—*Sketches in Turkey.*